MARCH 1978 Number 403 - Part I

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Solar-Geophysical Data prompt reports

MAY 01 1978

Data for February 1978 -- January 1978
Explanation of Data Reports Issued as Number 402 (Supplement) February 1978

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Pt. 1

NEW DATA PAGES 116-131

noaa NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION / ENVIRONMENTAL DATA SERVICE / BOULDER, COLORADO

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Solar - Geophysical Data

NO. 403 MARCH 1978

Part I (Prompt Reports)

DATA FOR
FEBRUARY 1978
JANUARY 1978

NATIONAL GEOPHYSICAL AND SOLAR - TERRESTRIAL DATA CENTER
BOULDER, COLORADO

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SOLAR-GEOPHYSICAL DATA

No. 403

Issued in two parts

Helen E. Coffey, Editor

J. Virginia Lincoln, Director
Solar-Terrestrial Data Services Division

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ALERT PERIODS

INTERNATIONAL URSIGRAM AND WORLD DAYS SERVICE

FEBRUARY 1978

PRESTO MESSAGES (THE RAPID REPORT OF MAJOR EVENTS).

08 FEBRUARY 1978, BOULDER 08/0420Z SOFLARE 2B N14E47 08/0344Z DURATION 27 MINUTES.
13 FEBRUARY 1978, BOULDER 13/1354Z PROTON EVENT 0835 GT 10 MEV 30 PROTONS CM^2/SEC/STER AT 1200Z.
13 FEBRUARY 1978, TOYOKAWA 13/0230Z TENFLARE 650 UNITS 13/0120Z 70 MINUTES DURATION.
13 FEBRUARY 1978, CULGOORA IMP 2N FLARE START 0129Z (N15W15) TYPE TWO AND TYPE FOUR BURSTS. FLEURS 1415 MHZ 1900 FLUX UNITS 0209Z, 2695 MHZ 1400 FLUX UNITS AT 0205Z, 4995 MHZ 740 FLUX UNITS 0204Z MAJOR SWF.
13 FEBRUARY 1978, BOULDER 13/0330Z SOFLARE M7 N15W17 13/0300Z MAX. START 13/0122Z, IN PROGRESS.
15 FEBRUARY 1978, TOYOKAWA 15/0755Z TENFLARE 100 UNITS 15/0747Z 5 MINUTES.
25 FEBRUARY 1978, TOYOKAWA 25/0315Z TENFLARE 100 UNITS 25/0307Z 3 MINUTES.
25 FEBRUARY 1978, BOULDER SOFLARE 2B/M4 N20W11 25/0305Z 8 MINUTES.
25 FEBRUARY 1978, BOULDER TENFLARE 100 FLUX UNITS 15/0307Z 3 MINUTES.
25 FEBRUARY 1978, BOULDER SOFLARE 1B N19W18 25/1449Z 23 MINUTES.
25 FEBRUARY 1978, BOULDER TENFLARE 160 FLUX UNITS 25/1448Z 16 MINUTES.
25 FEBRUARY 1978, KAKIOKA MAGSTORM 25/1929Z.

SUMMARY OF THE GEOALERT WWA MESSAGES

Message serial number	Date of issue	Date of observation	Wolf number	10 cm solar flux	A index	Active Regions: Location Lat-Long	No. of Flares: Total	M	X	Outstanding events	Forecasts: Date	Location Lat-Long	Desc*	Alert Situations
32	1	31	181	140	18	N19W76	0	0	0		1	N19W76	Q	SOLALERT MINOR 02 MAGALERT MINOR 02
						S27W03	1	0	0			S27W03	E	STRATWARM ALERT /WEDNESDAY/S.TRAT-
						S17W07	0	0	0			S17W07	Q	WARM EXISTS NORTHERN GREENLAND
						N19E12	7	0	0			N19E12	E	EASTWARD TO EURASIAN ARCTIC.
						N14W02	0	0	0			N14W02	Q	
						N13E30	0	0	0			N13E30	Q	
						S27E17	0	0	0			S27E17	Q	
						N26E71	0	0	0			N26E71	Q	
						N27E54	0	0	0			N27E54	Q	
						S26E75	0	0	0			S26E75	Q	
33	2	1	146	143	10	N19E12	7	0	0		2	N19E12	E	SOLALERT MINOR 02 MAGALERT MINOR 02
						S27W03	1	0	0			S27W03	E	STRATWARM ALERT /THURSDAY/ STRATWARM
						S17W03	0	0	0			S17W03	Q	EXISTS EURASIAN ARCTIC.
						N19W76	0	0	0			N19W76	Q	
						N14W02	0	0	0			N14W02	Q	
						N13E30	0	0	0			N13E30	Q	
						S27E17	0	0	0			S27E17	Q	
						N26E71	0	0	0			N26E71	Q	
						N27E54	0	0	0			N27E54	Q	
						S26E75	0	0	0			S26E75	Q	
34	3	2	204	157	11	S28W18	2	0	0		3	S28W18	E	SOLALERT 03/XX MAGALERT MINOR 03
						S17W20	0	0	0			S17W20	Q	STRATWARM ALERT /FRIDAY/ STRATWARM
						N18W00	9	1	0			N18W00	A	EXISTS EURASIAN ARCTIC DECREASING.
						N12W15	0	0	0			N12W15	Q	
						S27E05	0	0	0			S27E05	Q	
						S28E60	0	0	0			S28E60	Q	
						N25E35	0	0	0			N25E35	Q	
						N19E64	0	0	0			N19E64	Q	
						N27E67	0	0	0			N27E67	Q	
						N19E75	0	0	0			N19E75	Q	
35	4	3	227	169	11	S17W38	0	0	0		4	S17W38	Q	SOLALERT 04/XX MAGALERT 04/05
						S29W28	5	0	0			S29W28	E	STRATWARM ALERT /SATURDAY/ DECREAS-
						N14W28	0	0	0			N14W28	Q	ING MAXIMUM TEMPERATURES OVER ASIAN
						N33W22	7	0	0			N33W22	A	ARCTIC. MODERATE WARMING MOVING
						N20W12	3	0	0			N20W12	E	SOUTHEASTWARD.
						N26E25	0	0	0			N26E25	Q	
						S26E46	0	0	0			S26E46	Q	
						N21E49	3	1	0			N21E49	A	
						N27E53	5	1	0			N27E53	A	
						N19E54	5	2	0			N19E54	A	
36	5	4	208	158	07	S16W52	0	0	0		5	S16W52	Q	SOLALERT 05/XX MAGALERT MINOR 05/05
						N13W41	1	0	0			N13W41	Q	
						S28W40	2	0	0			S28W40	E	
						N32W35	4	0	0			N32W35	Q	
						N20W24	0	0	0			N20W24	Q	
						N26E09	0	0	0			N26E09	Q	
						S27E35	1	0	0			S27E35	Q	
						N22E37	0	0	0			N22E37	E	
						N19E40	0	0	0			N19E40	E	
37	6	5	234	164	13	S30W58	2	0	0		6	S30W58	E	SOLALERT 06/XX MAGNIL
						S18W65	0	0	0			S18W65	Q	
						N18W39	0	0	0			N18W39	Q	
						S26E23	2	0	0			S26E23	Q	
						N22E19	2	0	0			N22E19	E	
						N28E27	0	0	0			N28E27	Q	
						N22E28	2	0	0			N22E28	E	
						N32W47	0	0	0			N32W47	Q	
						N19E76	2	0	0			N19E76	E	
						S25W49	0	0	0			S25W49	Q	
38	7	6	214	161	09	S30W73	0	0	0		7	S30W73	E	SOLALERT 07/XX MAGQUIET
						S15W82	0	0	0			S15W82	Q	
						N18W52	3	0	0			N18W52	Q	
						S27E08	1	0	0			S27E08	Q	
						N21E06	0	0	0			N21E06	E	
						N28E14	0	0	0			N28E14	E	
						N20E15	0	0	0			N20E15	Q	
						N30W61	0	0	0			N30W61	E	
						N18E61	5	0	0			N18E61	Q	
						S25W62	0	0	0			S25W62	Q	
						N27W49	0	0	0			N27W49	Q	
39	8	7	195	162	07	S27W86	0	0	0		8	S27W86	Q	SOLALERT 08/XX MAGQUIET
						N21W64	1	0	0			N21W64	E	
						S29W04	0	0	0			S29W04	Q	
						N22W04	0	0	0			N22W04	Q	
						N27E04	5	0	0			N27E04	E	
						N19E05	0	0	0			N19E05	Q	
						N37W83	0	0	0			N37W83	Q	
						N16E51	7	0	0			N16E51	A	
						S23W80	0	0	0			S23W80	Q	
						N27W68	0	0	0			N27W68	Q	

ALERT PERIODS

INTERNATIONAL URSIGRAM
AND WORLD DAYS SERVICE

FEBRUARY 1978

SUMMARY OF THE GEOALERT WWA MESSAGES

Message serial number	Date of issue	Date of observation	Wolf number	10 cm solar flux	A index	Active Regions				Outstanding events	Forecasts			Alert Situations
						Location	No. of Flares				Date	Location	Desc[a]	
						Lat-Long	Total	M	X			Lat-Long		
40	9	8	163	165	10	N10W80	1	0	0		9	N10W80	Q	SOLALERT 09/XX MAGQUIET
						S29W19	0	0	0			S29W19	Q	
						N22W16	1	0	0			N22W16	Q	
						N28W09	6	0	0			N28W09	E	
						N20W03	0	0	0			N20W03	Q	
						N16E36	18	1	0			N16E36	A	
						S22E73	0	0	0			S22E73	Q	
41	10	9	162	160	07	S29W28	2	0	0		10	S29W28	E	SOLALERT 10/XX MAGQUIET
						N21W27	2	0	0			N21W28	Q	
						N26W21	10	2	0			N26W21	E	
						N18W19	0	0	0			N18W19	Q	
						N12E23	24	1	0			N12E23	E	
						S24E60	0	0	0			S24E60	Q	
						S29E51	0	0	0			S29E51	Q	
42	11	10	124	153	07	S29W43	0	0	0		11	S29W43	Q	SOLALERT 11/XX MAGALERT
						N21W42	3	1	0			N21W42	E	
						N26W35	2	0	0			N26W35	E	
						N18W30	1	0	0			N18W30	Q	
						N15E09	16	2	0			N15E09	E	
						S24E47	0	0	0			S24E47	Q	
						S29E38	0	0	0			S29E38	Q	
43	12	11	178	158	07	S29W56	0	0	0		12	S29W56	Q	SOLALERT MAGNIL
						N19W53	3	0	0			N19W53	E	
						N25W48	4	0	0			N25W48	E	
						N17W42	1	0	0			N17W42	Q	
						N17W03	11	1	0			N17W03	E	
						S24E35	0	0	0			S24E35	Q	
						S28E26	0	0	0			S28E26	Q	
						S26W03	0	0	0			S26W03	Q	
44	13	12	170	163	05	N22W66	0	0	0		13	N22W66	Q	SOLALERT 13/XX MAGQUIET
						N27W59	1	0	0			N27W59	Q	
						N17W53	0	0	0			N17W53	Q	
						N14W17	10	1	0			N14W17	E	
						S23E22	0	0	0			S23E22	Q	
						S30E12	0	0	0			S30E12	Q	
						S27W17	0	0	0			S27W17	E	
45	14	13	164	155	06	N23W81	1	0	0	PROTON EVENT START-	14	N23W81	Q	SOLALERT 14/XX MAGALERT 15/XX
						N25W71	0	0	0	ED AT 13/0835Z FROM		N25W71	Q	
						N17W66	3	0	0	2N FLARE WHICH		N17W66	E	
						N14W30	27	2	0	MAXED 13/0155Z FROM		N14W30	A	
						S24E10	0	0	0	N15W15 REGION 1001.		S24E10	Q	
						S28E02	0	0	0	PROTON EVENT STILL		S28E02	Q	
						S28W30	1	0	0	IN PROGRESS		S28W30	Q	
						N31E72	0	0	0			N31E72	Q	
46	15	14	163	152	05	N25W83	0	0	0	PCA STILL IN PROG-	15	N25W83	Q	SOLALERT 16/XX MAGALERT MINOR 15/XX
						N16W86	0	0	0	RESS		N16W86	Q	
						N15W42	10	0	0			N15W42	A	
						S24W03	0	0	0			S24W03	Q	
						S28W12	1	0	0			S28W12	E	
						S28W43	0	0	0			S23W43	Q	
						N31E60	1	0	0			N31E60	E	
						N32E66	0	0	0			N32E66	Q	
47	16	15	96	140	35	N14W53	17	2	0		16	N14W53	A	SOLALERT 16/18 MAGALERT MINOR 16/18
						S24W16	0	0	0			S24W16	Q	
						S26W55	0	0	0			S26W55	Q	
						N30E46	6	0	0			N30E46	E	
						N18E74	5	0	0			N18E74	E	
48	17	16	141	133	08	N13W69	9	0	0		17	N13W69	E	SOLALERT 17/18 MAGALERT
						S25W24	2	0	0			S25W24	Q	
						S30W68	0	0	0			S30W68	Q	
						N33E35	6	0	0			N33E35	A	
						N23E61	0	0	0			N23E61	A	
						N27W34	8	0	0			N27W34	Q	
49	18	17	91	129	06	N16W83	7	2	0		18	N16W83	E	SOLALERT 18/XX MAGNIL
						N32E21	10	0	0			N32E21	Q	
						N23E47	0	0	0			N23E47	Q	
						N24W49	0	0	0			N24W49	A	
						N17E07	0	0	0			N17E07	Q	
50	19	18	96	128	08	N30E11	1	0	0		19	N30E11	Q	PROTON FLARE ALERT 19/20 (49016)
						N19E37	1	0	0			N19E37	Q	MAGQUIET
						N28W59	9	0	0			N28W59	E	
						N21E73	0	0	0			N21E73	Q	
						S26W41	0	0	0			S26W41	Q	
						S26E56	0	0	0			S26E56	Q	
						N16W90	1	0	0			N16W90	E	

ALERT PERIODS

INTERNATIONAL URSIGRAM AND WORLD DAYS SERVICE

FEBRUARY 1978

SUMMARY OF THE GEOALERT WWA MESSAGES

Message serial number	Date of issue	Date of observation	Wolf number	10 cm solar flux	A index	Active Regions Location Lat-Long	No. of Flares Total	M	X	Outstanding events	Forecasts Date	Location Lat-Long	Desc*	Alert Situations
51	20	19	92	122	09	N30W00	0	0	0		20	N30W00	Q	PROTON FLARE ALERT 20 (49016)
						N19E23	0	0	0			N19E23	Q	MAGQUIET
						N29W72	2	0	0			N29W72	Q	
						N21E59	0	0	0			N21E59	Q	
						S25W55	0	0	0			S25W55	Q	
52	21	20	104	125	10	N31W13	0	0	0		21	N31W13	Q	SOLALERT 21/23 MAGQUIET
						N20E09	0	0	0			N20E09	Q	
						N26W85	2	0	0			N26W85	Q	
						N21E45	4	0	0			N21E45	E	
						S22E75	0	0	0			S22E75	Q	
						N38E78	5	0	0			N38E78	E	
53	22	21	126	125	08	N30W29	0	0	0		22	N30W29	Q	SOLNIL MAGQUIET
						N21W32	0	0	0			N21W32	Q	
						N21E31	2	0	0			N21E31	Q	
						S22E67	0	0	0			S22E67	Q	
						N39E58	1	0	0			N39E58	Q	
						N16E72	0	0	0			N16E72	Q	
54	23	22	124	131	13	N28W41	0	0	0		23	N28W41	Q	SOLQUIET MAGQUIET
						N19W14	2	0	0			N19W14	Q	
						N20E16	1	0	0			N20E16	Q	
						S20E55	0	0	0			S20E55	Q	
						N39E44	0	0	0			N39E44	Q	
						N17E58	0	0	0			N17E58	Q	
						S23E73	0	0	0			S23E73	Q	
55	24	23	135	135	05	N30W52	0	0	0		24	N30W52	Q	SOLQUIET MAGQUIET
						N20W29	0	0	0			N20W29	Q	
						N19W22	0	0	0			N19W22	Q	
						N22E06	3	0	0			N22E06	Q	
						N38E32	0	0	0			N38E32	Q	
						S21E43	0	0	0			S21E43	Q	
						N17E49	0	0	0			N17E49	Q	
						S25E68	1	0	0			S25E68	Q	
						S25E85	0	0	0			S25E85	Q	
56	25	24	155	139	04	N30W65	0	0	0		25	N30W65	Q	SOLQUIET MAGALERT MINOR 25/27
						N21W42	0	0	0			N21W42	Q	
						N22W09	11	0	0			N22W09	E	
						S20E30	0	0	0			S20E30	Q	
						N38E21	0	0	0			N38E21	Q	
						S23E51	0	0	0			S23E51	Q	
						N19W36	0	0	0			N19W36	Q	
						S25E71	0	0	0			S25E71	Q	
						N18E66	0	0	0			N18E66	Q	
57	26	25	155	142	10	N30W75	0	0	0	MAGSTORM 25/1928Z SSC. SOFLARE 2B/ M4 N20W11 25/0305Z, 8 MINUTES. TEN-FLARE 100 FLUX UNITS 25/0307Z, 3 MINUTES. TENFLARE 160 FLUX UNITS 25/1448Z, 16 MINUTES. SOFLARE 1B N19W18 25/1449Z, 23 MINUTES.	26	N30W75	Q	SOLQUIET MAGALERT 26/27
						N20W55	0	0	0			N20W55	Q	
						N21W21	7	2	0			N21W21	A	
						S20E18	0	0	0			S20E18	Q	
						N38E08	0	0	0			N38E08	Q	
						S23E39	0	0	0			S23E39	Q	
						S24E60	2	0	0			S24E60	Q	
						N18E55	0	0	0			N18E55	Q	
58	27	26	199	138	22	N30W88	0	0	0		27	N30W88	Q	SOLALERT 27/XX MAGALERT 27
						N22W34	10	0	0			N22W34	A	
						S20E04	0	0	0			S20E04	Q	
						N40W02	0	0	0			N40W02	Q	
						S23E25	0	0	0			S23E25	Q	
						S26E49	3	0	0			S26E49	Q	
						N18E44	0	0	0			N18E44	Q	
						N15E21	0	0	0			N15E21	Q	
						S29E34	0	0	0			S29E34	Q	
59	28	27	179	140	28	N22W46	9	0	0		28	N22W46	E	SOLALERT MINOR 28 MAGALERT MINOR 28
						S20W07	0	0	0			S20W07	Q	
						N38W13	3	0	0			N38W13	Q	
						S22E17	0	0	0			S22E17	Q	
						S25E40	0	0	0			S25E40	Q	
						N18E34	1	0	0			N18E34	Q	
						N17E11	0	0	0			N17E11	Q	
						S28E25	0	0	0			S28E25	Q	
60	1	28	178	138	28	N20W61	2	0	0		1	N20W61	Q	SOLNIL MAGALERT MINOR 01
						S20W22	0	0	0			S20W22	Q	
						N38W28	2	0	0			N38W28	Q	
						S23W00	0	0	0			S23W00	Q	
						S24E23	0	0	0			S24E23	Q	
						N20E16	0	0	0			N20E16	Q	
						N23W51	0	0	0			N23W51	Q	
						N13W04	0	0	0			N13W04	Q	
						S26E09	0	0	0			S26E09	Q	

* Q=Quiet E=Eruptive A=Active P=Proton C=Caution D=Doubtful O.G.=Other Groups MF=Major Flare

RELATIVE SUNSPOT NUMBERS

ZURICH, R_z

1977 PROVISIONAL — 1978

DAY	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB
1	0	7	15	44	42	17	22	43	44	20	84	128
2	8	11	14	43	45	15	29	37	40	20	88	120
3	8	10	22	43	42	24	29	47	25	31	102	131
4	8	7	23	49	39	19	25	47	22	47	102	138
5	8	7	18	40	40	23	20	48	25	58	73	137
6	9	8	16	39	40	26	26	55	27	58	69	129
7	8	7	12	41	25	28	25	57	34	55	42	121
8	20	0	19	38	20	25	18	52	27	45	36	89
9	20	0	25	33	17	30	30	47	31	58	36	94
10	19	0	29	29	23	25	40	38	25	75	15	96
11	19	8	34	27	9	23	45	28	26	71	18	95
12	14	12	35	22	8	29	51	33	27	62	26	92
13	8	16	26	20	10	40	48	53	28	44	26	93
14	7	22	33	25	7	40	47	48	31	37	36	82
15	0	29	26	8	0	42	53	54	39	41	30	59
16	0	31	25	8	0	38	56	53	49	39	23	64
17	8	32	20	8	0	36	53	51	51	29	24	56
18	0	29	12	21	0	40	60	50	54	33	14	55
19	0	22	0	33	7	35	59	54	52	40	8	53
20	0	12	11	21	6	33	60	54	38	23	7	52
21	0	28	14	28	8	33	58	42	32	23	20	63
22	10	19	7	40	23	38	42	35	28	17	30	74
23	9	18	7	57	30	15	41	30	24	23	43	69
24	7	8	7	60	38	19	48	29	18	31	37	78
25	14	0	0	74	42	25	46	28	10	35	32	94
26	8	14	7	71	42	34	49	30	9	41	47	86
27	9	8	13	74	37	38	54	38	14	50	69	79
28	10	11	16	65	26	36	61	37	9	45	79	88
29	16	10	28	50	16	40	64	42	10	58	90	
30	8	9	30	45	10	36	60	45	23	64	104	
31	8		40		8	31		52		67	116	
MEAN	8.7	12.9	18.6	38.5	21.4	30.1	44.0	43.8	29.1	43.2	49.3	89.8

1976 yearly mean = 12.6

DAILY SOLAR FLUX AT 2800 MHz
OTTAWA ARO

FLUX ADJUSTED TO 1 A.U., S_a

1977 — 1978

DAY	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB
1	72.6	74.8	77.2	88.9	102.8	83.8*	83.1	93.8*	94.4	88.4	126.9*	139.1
2	75.4	76.3	78.5	90.9*	100.7	82.8	84.2	93.2	93.6	91.2	133.9	152.6
3	74.8	76.6	81.9	93.0*	97.4	82.3	87.2	97.4	90.4	93.7	130.2	156.6*
4	76.9	76.8	81.4*	94.2	94.0	82.9*	84.2	98.8	89.4	95.9	124.8	154.0
5	77.6	75.5	79.6	90.2*	88.0*	86.4	85.6	104.0*	90.6	96.9	119.2	159.0
6	77.6	76.1	78.5	90.6	90.2	88.2	84.9	103.5	91.1	102.0*	118.7*	156.1
7	77.2	75.5*	77.1*	92.0	85.2	86.9	89.3	105.5	90.2	105.5	111.6	157.3
8	81.6	74.3	77.9	91.9*	82.1	85.1	91.6	103.8	90.3	106.7	102.8	157.0*
9	80.3	74.8	83.6	90.9	79.0	85.9	95.9	100.7	91.1	112.6*	97.0	155.2
10	80.5	76.5	80.8	89.2*	76.9	87.2	99.8	96.4	93.1	114.7	93.5	148.7
11	78.9	79.2	80.8	87.2	76.2	87.6	104.6	95.3	94.9	107.4	93.1	154.2
12	78.6	80.2	79.7	83.3	75.8	86.5	107.8	100.8	91.4	111.0	92.1	159.0
13	77.9	82.7	81.5	84.2	77.8	89.0	112.9	98.5	94.0	100.6	90.3	151.2
14	77.2	83.4	84.8	82.3	76.8	87.5	118.2	98.9	97.9	93.7*	88.6	148.4
15	74.8	86.8	85.0	82.3	76.0	86.9	120.7	98.2	97.9	92.5	89.6	136.8
16	74.1	83.7	85.1	81.4	76.9	87.3	120.4	96.8	95.9	92.5	86.4	130.2
17	74.1	83.6	84.1	82.4	76.5	87.1	120.6	94.9	100.4	91.1	83.8	125.9
18	73.9	80.8	82.9	84.3	76.9	88.6	120.5	95.4	102.0*	93.6	84.7	124.9
19	74.0	79.3*	82.1	85.2	76.9	87.0	104.5	105.0	99.2	91.8	85.4	119.1
20	72.3	80.4*	81.3	88.9	80.1	88.7	108.8	99.6*	95.7*	88.7	87.0	122.2
21	72.8	80.8	81.4	92.4	81.7	90.8	104.9*	98.6*	92.8	87.8	91.4	122.2
22	74.6	80.1	82.9	98.8*	83.1	89.6	102.4	93.9	89.3	89.9	96.9	127.7
23	74.7	77.5	82.4	99.4	85.0	86.0	99.3	87.3	88.0	91.2	99.6	131.8
24	74.8	76.5	79.2	107.4	84.8	86.0	100.6	88.3	86.7	93.9	100.4	135.6
25	74.0	76.4	77.4	113.8	86.0	87.7	98.5	88.1	84.7	96.3	103.3	139.3
26	75.1	75.4	76.8	120.7	86.0	86.4	99.4	88.6	84.1	99.3	112.7	134.8
27	74.5	74.9	77.9	115.9*	85.4	85.4	100.0	88.5	83.8	98.3	116.4	137.5
28	74.4	74.2	79.1	113.4	87.5	82.4	100.8	90.3*	85.6	98.9	127.7*	135.4
29	75.4	74.8	81.7	111.9	86.7	86.1	99.4	90.3	85.6	105.6*	132.2*	
30	74.6	76.6	89.9	106.9	84.1	85.5	97.7	94.9	85.3	114.7	134.9	
31	74.1		92.0		80.4	84.7		95.9		120.2	133.3*	
MEAN	75.8	78.2	81.4	94.5	83.7	86.4	100.9	96.3	91.6	98.9	106.1	141.8

* adjusted for burst

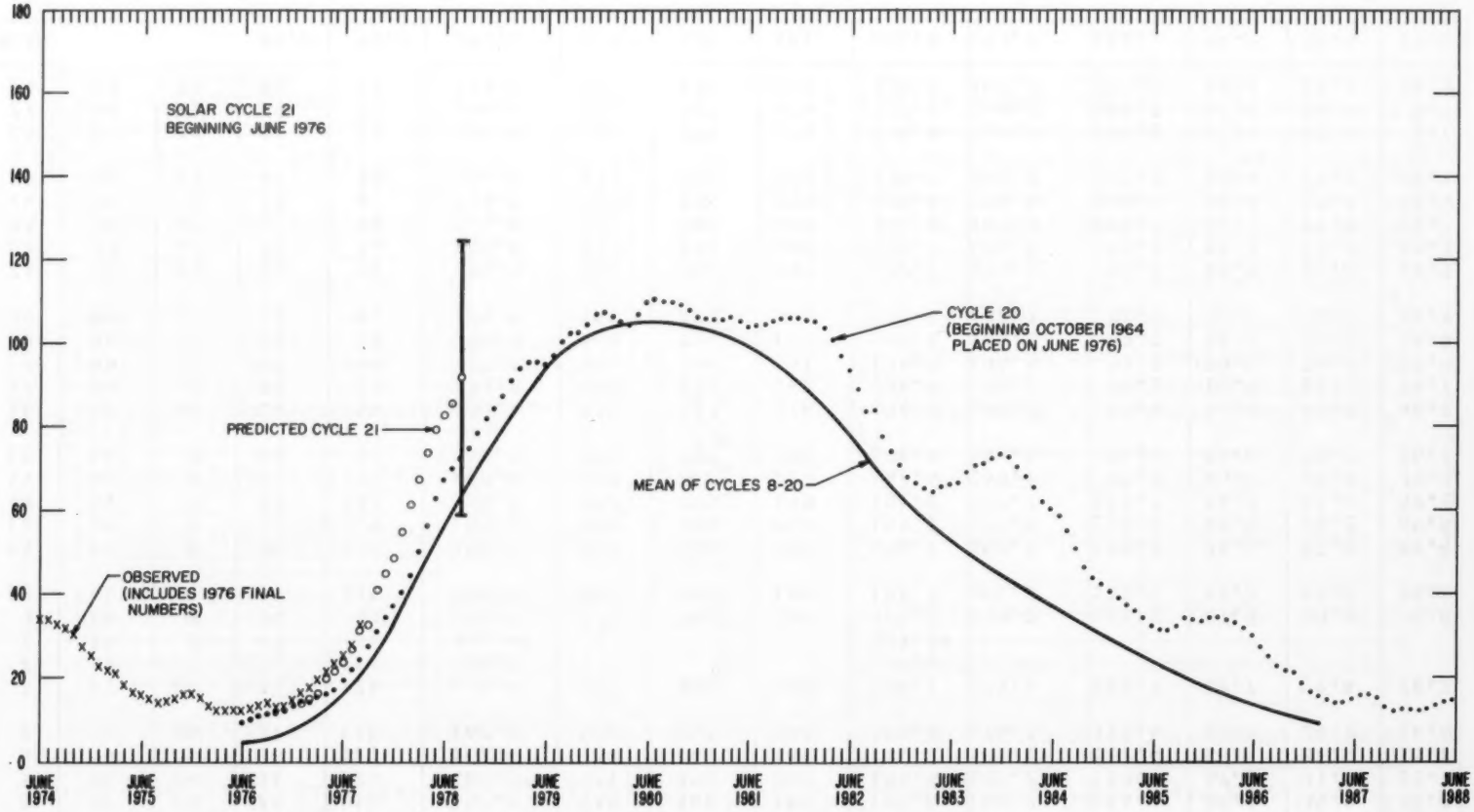
DAILY SOLAR INDICES

FEBRUARY 1978

FEB 1978	YEAR DAY	BARTELS 27-DAY CYCLE NUMBER	SUNSPOT NUMBERS		OBSERVED FLUX	SOLAR FLUX ADJUSTED TO 1 A.U.								
			R_Z	$R_{A'}$	OTTAWA 2800	AFGL 15400	AFGL 8800	AFGL 4995	OTTAWA 2800	AFGL 2695	AFGL 1415	AFGL 606	AFGL 410	AFGL 245
1	32	22	128	111	143.3	576	327	177	139.1	151.9	103.3	61.2	29.4	10.6
2	33	23	120	114	157.2	579	340	188	152.6	169.0	114.3	67.8	35.0	20.0
3	34	24	131	124	161.3*	571	358	203	156.6*	181.2	113.5	67.1	31.9	13.7
4	35	25	138	122	158.4	574	341	184	154.0	169.1	112.4	66.4	34.5	13.8
5	36	26	137	126	163.6	581	347	193	159.0	174.7	119.4	65.2	31.1	14.9
6	37	27	129	128	160.6	577	352	190	156.1	172.5	110.3	60.7	29.9	20.2
7	38	1	121	112	161.7				157.3					
8	39	2	89	84	161.4*				157.0*					
9	40	3	94	93	159.5	575	352	204	155.2	170.0	111.8	67.9	39.5	45.5
10	41	4	96	108	152.7	564	343	198	148.7	161.3	102.5	65.2	43.0	50.6
11	42	5	95	129	158.3	563	346	199	154.2	167.3	105.0	71.4	57.8	82.4
12	43	6	92	119	163.2	580	363	213	159.0	175.9	104.6	67.8	46.2	65.6
13	44	7	93	100	155.1	582	355	199	151.2	157.7	103.7	64.0	41.4	52.0
14	45	8	82	82	152.2	580	362	203	148.4	160.1	99.0	64.8	33.0	39.8
15	46	9	59	68	140.3	576	347	188	136.8	144.6	94.4	61.6	35.7	56.1
16	47	10	64	56	133.4	572	337	176	130.2	140.2	89.9	64.3	41.2	46.0
17	48	11	56	53	129.0	563	320	167	125.9	136.1	89.1	60.9	27.4	26.7
18	49	12	55	54	127.8	564	316	161	124.9	134.8	92.2	59.5	21.7	13.9
19	50	13	53	53	121.9	560	314	157	119.1	128.8	90.0	65.1	31.6	18.0
20	51	14	52	61	124.9	562	320	158	122.2	132.3	90.5	60.6	30.9	14.8
21	52	15	63	64	124.9	568	321	157	122.2	131.6	93.2	60.9	27.6	12.8
22	53	16	74	81	130.6	573	322	162	127.7	136.8	95.0	62.3	28.2	15.3
23	54	17	69	88	134.6	575	324	168	131.8	143.8	100.7	60.7	27.9	18.7
24	55	18	78	91	138.5	569	325	169	135.6	145.6	100.1	63.8	27.3	17.4
25	56	19	94	93	142.1	571	326	176	139.3	152.9	107.3	69.4	23.8	10.1
26	57	20	86	77	137.6	569	325	170	134.8	149.5	104.5	67.8	23.4	9.7
27	58	21	79	75	140.2	568	327	174	137.5	149.7	104.0	67.8	24.5	9.3
28	59	22	88	78	138.0	571	336	175	135.4	147.7	103.4	68.8	28.8	10.2
MEAN			89.8	90.9	145.4	572	336	181	141.8	153.3	102.1	64.7	32.8	27.2

* Adjusted for burst.

Note: Data gaps in AFGL Sagamore Hill are due to equipment problems.



OBSERVED AND PREDICTED SUNSPOT NUMBERS

SMOOTHED OBSERVED AND PREDICTED SUNSPOT NUMBERS
CYCLE 21

MONTH	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1976	15.2	13.2	12.2	12.6	12.5	12.2	12.9	14.0	14.3	13.4	13.5	14.8
1977	16.7	18.1	20.0	22.2	24.2	26.3	28.8	33.0	37.5	41.7	46.2	50.6
									(1)	(3)	(6)	(9)
1978	55.6	61.1	66.5	72.0	78.3	83.8	88.2	92.0	95.6	99.3	104.0	110.2
	(12)	(14)	(17)	(20)	(23)	(26)	(29)	(33)	(35)	(36)	(35)	(35)
1979	115.5	119.9	124.1	127.3	130.1	134.2	138.6	141.5	143.0	143.5*	143.3	142.3
	(35)	(35)	(37)	(38)	(39)	(41)	(43)	(44)	(47)	(49)	(52)	(54)
1980	140.6	139.1	138.5	138.6	137.6	134.7	131.5	128.8	127.4	126.7	125.5	124.4
	(54)	(54)	(52)	(53)	(54)	(54)	(55)	(55)	(54)	(54)	(55)	(57)
1981	124.5	123.9	121.6	118.8	116.9	115.3	114.9	115.1	114.8	113.7	111.9	109.0
	(58)	(58)	(56)	(55)	(54)	(52)	(50)	(49)	(48)	(47)	(45)	(43)
1982	105.6	102.4	99.9	98.2	96.1	93.2	89.2	84.8	81.0	76.9	73.9	70.6
	(41)	(40)	(39)	(38)	(36)	(35)	(33)	(31)	(29)	(25)	(24)	(23)
1983	67.0	64.6	62.9	61.1	59.2	57.0	55.3	53.8	52.3	51.0	50.0	49.3
	(22)	(22)	(22)	(23)	(23)	(23)	(24)	(25)	(27)	(29)	(30)	(30)
1984	48.1	46.3	43.6	40.4	37.9	36.6	35.4	33.6	32.2	31.3	30.2	28.8
	(30)	(30)	(29)	(28)	(29)	(31)	(31)	(31)	(30)	(29)	(27)	(27)
1985	27.8	26.9	26.0	25.5	24.7	23.8	23.0	22.2	21.5	20.7	19.7	19.2
	(27)	(26)	(26)	(26)	(26)	(24)	(23)	(22)	(22)	(23)	(24)	(24)
1986	19.1	18.7	18.2	17.3	16.2	15.2	14.4	13.8	13.4	13.0	12.8	12.5
	(24)	(24)	(23)	(22)	(21)	(20)	(19)	(18)	(17)	(15)	(14)	(13)
1987	12.5	12.7	13.3	14.0	14.9							
	(11)	(11)	(11)	(11)	(13)							

The table gives observed Zürich smoothed sunspot numbers for Cycle 21 up to the one calculated from the latest observed data, marked by a vertical bar. They are based on final Zürich numbers through 1977 and provisional Zürich numbers thereafter. Some of these data after the June 1976 value will change slightly when final data for 1978 are received. The numbers after the vertical bar are predictions by the McNish-Lincoln method (see *Explanation of Data Reports*, February 1978). Shown in parentheses are the corresponding absolute values of the 90% confidence interval, an indication of the uncertainty above and below the predicted number.

The McNish-Lincoln method is very sensitive to the identification of a minimum epoch. In SGD 390-401 issues, the Cycle 21 predictions were based on March 1976 as the minimum epoch. Latest studies, including one published by Waldmeier, show that June 1976 is the more appropriate epoch of minimum. Thus, we have adopted a June 1976 mimimum.

*Prediction of Sunspot Maximum -- The McNish-Lincoln prediction method is recommended for predictions up to only one year ahead. From that point, the predictions regress rapidly towards the mean value. Combining this McNish-Lincoln prediction of sunspot maximum with the Ohl method (as done by Sargent, see *Explanation of Data Reports*, February 1978) indicates that the most probable value for sunspot maximum is 149 ± 47.

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OBSERV-ATORY	OBSERVED UT				LOCATION					DURATION	IMPORTANCE	OBS.		MEASUREMENTS			REMARKS
					APPROX.		CENTRAL	MCMATH PLAGE	CMP								
	DATE FEB	START	MAX. PHASE	END	LAT.	MER. DIST.	DISTANCE	REGION	DAY	MIN.		CORD.	TYPE	TIME UT	MEAS. AREA Millionths of Disk	CORR. AREA Sq. Deg.	
PALE	01	0124	0145	0223	N21	E27	.619	15126	3.1	59	1N	3	V		195		F
MANI	01	0141	0150	0219D	N19	E27	.600		3.1	38D	SN	3	P		140	1.7	F
MONT	01	0919	0925	0932	N22	E90	1.001		8.1	13	SF		C	0925	20		B
MONT	01	0955	0959	1003	N26	E60	.918		5.9	8	SF		C	0959	50		
PALE	01	2125	2127	2128	N21	E16	.526		3.1	3	SF	3	C		20		DE
PALE	01	2307	2321U	2332	S28	W 4	.371		1.7	25	SF	3	C		27		DE
PALE	01	2315	2315	2321	N21	E15	.519		3.1	6	SF	3	C		28		DE
PALE	01	2359	0002	0016	N21	E15	.519		3.1	17	SN	2	C		44		DE
MANI	02	0817	0823	0835	N21	E13	.505		3.3	18	SN	3	P		80	1.0	F
TEHR	02	0823	0825	0836	N19	E 9	.454		3.0	13	SF	1	C		64		F
HTPR	02	0842	0844	0903	N22	E12	.513		3.3	21	SF		C	0844	20	.2	E
HTPR	02	0859	0902	0906	S17	W17	.336		1.1	7	SF		C	0902	10	.1	
HTPR	02	0907	0908	0921	S33	W14	.493		1.3	14	SF		C	0908	10	.1	
HTPR	02	0945	1002	1017	S28	W15	.435		1.3	32	SF		C	1002	20	.2	E
HTPR	02	1039	1050	1105	S24	W13	.366		1.5	26	SF		C	1050	30	.3	E
HTPR	02	1045	1046	1050	S25	W22	.470		31.8	5	SF		C	1046	10	.1	
HTPR	02	1128	1131	1135	S29	W20	.490		1.0	7	SF		C	1131	20	.2	E
HTPR	02	1133		1150D	N22	E11	.507	15126	3.3	17D	1B		C	1136	250	2.5	E
HTPR	02	1137		1150D	N18	E03	.418		2.7	13D	SF		C	1140	10	.1	
TEHR	02	1137	1141	1155	N19	E 7	.445		3.0	18	SN	1	C		95		F
HTPR	02	1352	1354	1405	N26	E78	.991		8.4	13	SF		C	1354	40	.9	
MCMA	02	1418	1422	1440	S30	W14	.453	15124	1.5	22	SF		C	1422	60	.7	E
MCMA	02	1457	1459	1505	N22	E85	.999	15135	9.0	8	SF		C	1459			D
MCMA	02	1606	1608	1643	S30	W17	.476	15124	1.4	37	SN		C	1608	45	.5	EH
MCMA	02	1608	1610	1630D	N22	E76	.984	15135	8.4	22D	SF		C	1610			D
MCMA	02	1630	1646	1655	N22	E76	.984	15135	8.4	25	SN		C	1646			E
MCMA	02	1720	1730	1738D	S30	W16	.468	15124	1.5	18D	SN		C	1730	60	.6	EH
MCMA	02	1734		1753D	N22	E74	.977	15135	8.3	19D	SN		C	1747			D
MCMA	02	1823	1825	1840	S30	W18	.484	15124	1.4	17	SN		C	1825	35	.4	EH
MCMA	02	1830	1842	1900D	S27	W16	.431	15124	1.6	30D	SN		C	1842	75	.8	E
MCMA	02	1835	1848	1858	N22	E74	.977	15135	8.3	23	SN		C	1840	20		D
PALE	02	1838	1845	1925	S28	W15	.435		1.7	47	SF	3	C		125		F H
PALE	02	1838	1845	1925	S28	W15	.435		1.7	47	SF	3	V		125		F H
PALE	02	1914	1922	1932	N21	E 4	.466		3.1	18	SF	3	V		38		
PALE	02	1914	1922	1932	N21	E 4	.466		3.1	18	SF	3	C		38		
PALE	02	2126	2126	2147	S28	W16	.443		1.7	21	SF	3	C		27		
PALE	02	2126	2126	2147	S28	W16	.443		1.7	21	SF	3	V		27		
PALE	02	2138	2147	2209D	N21	E 3	.464	15128	3.1	31D	1N	3	C		289		FDE
PALE	02	2336E	2337U	2355D	N21	E 3	.464		3.2	19D	SN	3	C		126		FDE
PALE	02	2359	0002	0016	N21	E15	.518		4.1	17	SN	3	C		44		DE
PALE	03	0157	0158	0207	S28	W18	.462		1.7	10	SF	3	C		54		F
PALE	03	0216E	0218U	0252D	N25	E70	.965		8.3	36D	SN	3	C		92		FDE
CATA	03	0750	0750	0755	S28	W26	.541		1.4	5	SB	2	C	0750	56	.6	
CATA	03	0805	0805	0805D	S32	W28	.595		1.2		SB	2	P	0805	56	.7	
HTPR	03	0806E		0820	N21	E60	.906		7.8	14D	SN		C	0806	100	2.0	
HTPR	03	0837	0840	0843	N27	E66	.951		8.3	6	SF		C	0840	50	1.1	
HTPR	03	0837	0840	0843	N20	E60	.904		7.9	6	SF		C	0840	50	1.0	
MONT	03	0837	0841	0846	N27	E67	.955		8.4	9	SF		C	0841	50		
MONT	03	0843	0846	0852	N35	W13	.685		2.4	9	SF		C	0846	40		E
MONT	03	0845	0852	0906	N22	W03	.479		3.1	21	SN		C	0852	100		E
HTPR	03	0847	0851	0912	N23	W02	.492		3.2	25	SF		C	0851	80	.8	
HTPR	03	0850	0856	0906	N22	W10	.501		2.6	16	SF		C	0856	20	.2	
MONT	03	0931	0932	0936	N27	E67	.955		8.4	5	SB		C	0932	50		
HTPR	03	0932	0932	0937	N20	E65	.934		8.3	5	SN		C	0932	60	1.2	
MONT	03	1021	1026	1044	N19	E62	.915		8.1	23	SN		C	1026	80		E
HTPR	03	1104	1106	1109	S31	W29	.596		1.3	5	SF		C	1106	20	.2	
MONT	03	1250	1255	1304	S26	W22	.480		1.9	14	SF		C	1255	40		E
HTPR	03	1305	1307	1310	N20	E65	.934		8.4	5	SF		C	1307	50	1.0	
MONT	03	1306	1307	1313	N27	E65	.946		8.4	7	SB		C	1307	50		
MONT	03	1306	1309	1314	S30	W31	.608		1.2	8	SF		C	1309	40		DH
MCMA	03	1346	1349	1355	S31	W32	.626	15124	1.2	9	SB		C	1349	60	.8	DH
HTPR	03	1348		1349D	S30	W32	.618		1.2	10	SN		C	1349	50	.6	
RAMY	03	1349	1349	1358	S30	W23	.530		1.9	9	SB	3	C		47		DE H
MCMA	03	1359	1403	1420	N20	E62	.917	15135	8.2	21	SB		C	1403	50	1.2	E
MCMA	03	1410		1445	N34	W17	.689	15136	2.3	35	SN		C	1415	25	.3	D
MCMA	03	1450	1455	1505	N34	W17	.689	15136	2.3	15	SN		C	1455	50	.7	E
MCMA	03	1522		1530D	N22	W10	.501	15126	2.9	8D	SN		C	1524	50	.6	E
MCMA	03	1536	1539	1543	S32	W33	.643	15124	1.2	7	SB		C	1539	50	.7	EH
HTPR	03	1536	1539	1541	S30	W33	.629		1.2	5	SF		C	1539	30	.3	
HTPR	03	1539	1540	1542	S28	W35	.636		1.0	3	SF		C	1540	30	.3	

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OBSERV-ATORY	OBSERVED UT				LOCATION					DURATION — MIN.	IMPORTANCE	OBS.			MEASUREMENTS			REMARKS
	DATE FEB	START	MAX. PHASE	END	APPROX. LAT.	APPROX. MER. DIST.	CENTRAL DISTANCE	MCMATH PLAGE REGION	CMP DAY			COND.	TYPE		TIME — UT	MEAS. AREA Mill. of Disk	CORR. AREA Sq. Deg.	
MCMA	03	1605	1611	1645	N21	E57	.885	15135	7.9	40	1B		C		1611	150	3.1	E
MCMA	03	1634	1646	1725	N34	W20	.703	15136	2.2	51	SB		C		1646	60	.9	E
MCMA	03	1701	1708	1720	N20	E59	.897	15135	8.1	19	SN		C		1708	75	1.5	E
MCMA	03	1728	1730	1800	N28	E60	.922	15134	8.2	32	SB		C		1730	30	.8	D
MCMA	03	1750	1810	1837D	N34	W20	.703	15136	2.2	47D	SN		C		1810	50	.7	E
MCMA	03	1802	1804	1815	N20	E58	.890	15135	8.1	13	SF		C		1804	60	1.2	E
MCMA	03	1806	1820	1832	N28	E59	.917	15134	8.2	26	SF		C		1820	25	.6	D
MCMA	03	1803	1809	1819	S28	W33	.615	15124	1.3	16	SN		C		1809	30	.4	D
MCMA	03	1838	1845	1915D	N34	W20	.703	15136	2.3	37D	SN		C		1845	50	.7	E
MCMA	03	1850	1856	1915	N28	E59	.917	15134	8.2	25	SN		C		1856	20	.5	D
MCMA	03	1912	1918	1923	S28	W34	.626	15124	1.3	11	SN		C		1918	25	.3	D
MCMA	03	1951E	2003	2013D	S32	W26	.577	15124	1.9	22D	1N		C		2003	170	2.1	E
PALE	03	2012	2343	0017D	N20	E53	.852	15135	7.8	245D	1F	3	C			165		
MCMA	03	2015E		2015D	N34	W22	.713	15136	2.2		SB		P		2015	80	1.2	E
PALE	03	2026E	2027U	2158D	N33	W18	.682		2.5	92D	3N	3	C			594		FDE
PALE	03	2116	2125	2154	N21	W10	.487		3.1	38	SN	3	C			117		DE
HTPR	04	0859	0901	0907	S26	W40	.680		1.4	8	SN		C		0901	40	.5	E
CATA	04	0905	0905	0915	S27	W41	.695	15124	1.3	10	1B	2	C		0905	168	2.4	
HTPR	04	0907	0910	0918	N20	E50	.827		8.1	11	SF		C		0910	10	.1	
HTPR	04	1521	1524	1532	N34	W26	.735		2.7	11	SF		C		1524	30	.3	
MCMA	04	1650	1651	1655	S32	W45	.756	15124	1.3	5	SN		C		1651	25	.4	E
MCMA	04	1710	1713	1734D	N16	W37	.681	15125	1.9	24D	SF		C		1713	80	1.2	E
PALE	04	1814	1817	1858	N20	E42	.755		7.9	44	SF	3	C			67		DE
PALE	04	1853	1857	1906	N33	W30	.750		2.5	13	SN	3	C			31		DE
PALE	04	2249	2249	2301	N25	E45	.807		8.3	12	SF	3	C			69		DE
PALE	05	0107	0109	0112	N21	E36	.703		7.7	5	SF	3	C			25		F
PALE	05	0116	0131	0156	N21	E35	.693	15135	7.7	40	1F	3	C			150		F
HTPR	05	1037	1040	1056	N18	E40	.724		8.4	19	SF		C		1040	30	.4	E
HTPR	05	1054	1058	1110	N24	W26	.636		3.5	16	SF		C		1058	10	.1	
HTPR	05	1122E		1140	S27	W47	.757		1.9	18D	SF		C		1125	20	.3	
CATA	05	1140	1155	1205	N14	E90	1.000	15139	12.2	25	1N	2	C		1155	84		T
RAMY	05	1220E	1226	1232	N19	E34	.669		8.1	12D	SN	3	C			86		DE
CATA	05	1310	1315	1340	N14	E90	1.000	15139	12.3	30	2N	2	C		1315	168		
RAMY	05	1326	1332	1343D	N19	E36	.689		8.3	17D	SF	4	C			42		DE
RAMY	05	1412	1415	1424D	S31	W45	.752		2.2	12D	SF	4	C			28		
MCMA	05	1610E		1650D	N16	E90	1.000	15139	12.4	40D	SN		C		1624			E
RAMY	05	1618	1627	1631	S28	E30	.584		7.9	13	SF	4	C			19		
MCMA	05	1623	1628	1640	S28	W48	.769	15124	2.1	17	SN		C		1628	30	.5	E
RAMY	05	1626	1629	1641	S31	W46	.761		2.2	15	SN	4	C			49		F H
PALE	05	1953	1959	2002	N15	E80	.990		11.8	9	SN	3	C			18		DE
CATA	06	0830E	0830	0850	N20	W39	.725		3.4	20D	SB	2	P		0830	84	1.2	
HTPR	06	0832	0833	0850	N20	W40	.735		3.4	18	SN		C		0833	80	1.0	E
HTPR	06	0928	0931	0936	N20	W40	.735		3.4	8	SF		C		0931	10	.1	
HTPR	06	0950	0956	1002	N20	W40	.735		3.4	12	SF		C		0956	10	.1	
MONT	06	1118	1120	1123	N27	E26	.665		8.4	5	SF		C		1120	20		D
HTPR	06	1203	1207	1214	S27	E21	.482		8.1	11	SF		C		1207	10	.1	
HTPR	06	1215	1219	1222	N20	W39	.725		3.6	7	SF		C		1219	10	.1	
MCMA	06	1431	1433	1437	N18	W44	.763	15126	3.3	6	SN		C		1433	40	.6	E
MCMA	06	1513	1515	1523	N14	E68	.942	15139	11.7	10	SN		C		1515	30	.9	D
MCMA	06	1529	1531	1536	N14	E68	.942	15139	11.7	7	SF		C		1531	30	.9	D
HTPR	06	1552	1554	1556	N25	E16	.572		7.9	4	SF		C		1554	10	.1	
HTPR	06	1608	1609	1619	S27	W60	.870		2.2	11	SF		C		1609	20	.4	
MCMA	06	1612	1614	1622	S28	W61	.879	15124	2.1	10	SF		C		1614	25	.5	D
HTPR	06	1620		1630D	N25	E16	.572		7.9	10D	SF		C		1630	20	.2	
MCMA	06	1733E		1734D	N18	W50	.819	15126	3.0	1D	SN		P		1733	50	.9	E
PALE	06	2159	2228	2255	N20	E25	.587		8.8	56	SF	3	C			28		F
PALE	06	2234	2236	2241	N13	E61	.896		11.5	7	SN	3	C			12		F
PALE	06	2334	2336	2350	N12	E64	.915		11.8	16	SN	3	C			44		F
PALE	07	0118	0220	0231	N12	E59	.878		11.5	73	SN	3	C			70		F
HTPR	07	0822	0837	0900	N17	E08	.415		7.9	38	SN		C		0837	90	.9	E
HTPR	07	0920	0921	0935	N20	E05	.449		7.8	15	SF		C		0921	30	.3	E
HTPR	07	1043	1043	1057	N20	E05	.449		7.8	14	SF		C		1043	30	.3	E
MONT	07	1138	1143	1149	N13	E51	.811		11.3	11	SF		C		1143	50		E
HTPR	07	1324	1330	1335	N13	E27	.544		9.6	11	SF		C		1330	30	.3	
MCMA	07	1425E		1600D	N15	E55	.852	15139	11.7	95D	1N		C		1500	220	4.2	EKL
HTPR	07	1452	1500	1509	N17	E08	.415		8.2	17	SF		C		1500	20	.2	E
HTPR	07	1527	1538	1600	N26	E07	.543		8.2	33	SF		C		1538	40	.4	E
MCMA	07	1527	1538	1620D	N27	E06	.555	15134	8.1	53D	SN		C		1538	80	1.0	E

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OBSERV-ATORY	OBSERVED UT				LOCATION					DURATION	IMPORTANCE	OBS.		MEASUREMENTS			REMARKS
	DATE FEB	START	MAX. PHASE	END	APPROX. LAT.	APPROX. MER. DIST.	CENTRAL DISTANCE	MCMATH PLAGE REGION	CMP DAY	MIN.		COND.	TYPE	TIME UT	MEAS. AREA Millionths of Disk	CORR. AREA Sq. Deg.	
MCMA	07	1658	1707	17090	N35	W74	.987	15136	2.2	110	SF		C	1707	20	.8	D
MCMA	07	1707	1723	1815	N26	E04	.536	15134	8.8	68	SN		C	1723	120	1.5	EH
PALE	07	1748	1758	1847	N25	E 7	.529		8.3	59	SF	3	C		40		F
MCMA	07	1707	1709	1715	N17	W65	.929	15126	2.8	8	SN		C	1709	20	.7	D
PALE	07	1825	1830	1836	N53	E14	.869		8.8	11	SN	3	C		25		F
PALE	07	1825	1830	1836	N14	E53	.832		11.7	11	SN	3	C		25		F
PALE	07	1842	1858	1937	N14	E54	.841		11.8	55	SB	3	C		102		F
PALE	07	1842	1858	1937	N54	E14	.877		8.8	55	SB	3	C		102		F
PALE	07	1935	1943	1956	N26	W62	.928		3.2	21	SF	3	C		25		F
MCMA	07	1935	1940	1957	N26	W63	.934	15126	3.1	22	SN		C	1940	20	.6	D
PALE	07	1941	1950	2002	N14	E51	.814		11.6	21	SN	3	C		66		F
PALE	07	2013	2114	2310	N13	E49	.791	15139	11.5	177	1N	3	C		185		UDE
PALE	07	2039	2043	2053	N25	E 6	.526		8.3	14	SF	3	C		64		F
PALE	07	2219	2226	2302	N25	E 5	.524		8.3	43	SF	3	C		132		DE F
MANI	08	0355E	0400	04180	N13	E45	.750	15139	11.5	230	2N	2	P		400	6.3	F
MANI	08	0449E	0449U	04560	N14	E48	.785	15139	11.8	70	1F	2	P		150	2.5	
MANI	08	0712	0716	0732	N26	W03	.534	15134	8.1	20	1B	3	P		250	3.1	
MONT	08	0718E	0809	0825	N27	W01	.547	15134	8.2	670	1N		C	0809	250		F
HTPR	08	0745E		0801	N26	W04	.535		8.8	160	SF		C	0748	100	1.0	E
MONT	08	0718E	0723	0726	N14	E47	.775		11.8	80	SF		C	0723	40		E
HTPR	08	0830	0832	0834	N14	E46	.765		11.8	4	SF		C	0832	20	.3	
HTPR	08	0844	0847	0849	N14	E46	.765		11.8	5	SF		C	0847	20	.3	
MONT	08	0845	0846	0849	N14	E47	.775		11.9	4	SF		C	0846	50		D
HTPR	08	0902	0906	0920	N19	W03	.427		8.2	18	SF		C	0906	30	.3	E
MONT	08	0904	0906	0919	N20	W01	.441		8.3	15	SF		C	0906	60		E
MONT	08	0918	0920	0925	N13	E39	.685		11.3	7	SN		C	0920	70		D
MONT	08	1046	1048	1054	N14	E46	.765		11.9	8	SF		C	1048	50		D
HTPR	08	1047	1048	1052	N14	E45	.754		11.8	5	SF		C	1048	10	.1	
HTPR	08	1111	1114	1138	N27	W05	.552		8.1	27	SF		C	1114	20	.2	E
MONT	08	1112	1122	11550	N28	W02	.562		8.3	430	SN		C	1122	80		E
CATA	08	1120E	1145	1210	N26	W03	.534	15134	8.2	500	1B	1	P	1145	224	2.7	
MONT	08	1119	1121	1125	N13	E38	.673		11.3	6	SF		C	1121	40		E
HTPR	08	1225	1228	1315	N26	W05	.537		8.1	50	SF		C	1228	30	.3	E
HTPR	08	1225	1303	1315	N26	W05	.537		8.1	50	SF		C				
MONT	08	1226	1232	12340	N28	W02	.562		8.4	80	SF		C	1232	60		E
HTPR	08	1343	1346	1353	N21	W04	.460		8.3	10	SF		C	1346	20	.2	E
RAMY	08	1406	1406	1415	N15	E41	.717		11.7	9	SB	4	C		22		F
RAMY	08	1418	1419	1440	N15	E41	.717		11.7	22	SB	4	C		49		F H
HTPR	08	1432	1434	1436	N14	E45	.754		12.0	4	SN		C	1434	60	.8	E
HTPR	08	1419	1426	1525	N26	W05	.537		8.2	66	SN		C	1426	80	.9	EK
RAMY	08	1423	1424	1454	N25	W 6	.525		8.1	31	SN	4	C		81		FDE
RAMY	08	1441	1444	14580	N15	E45	.759		12.0	90	SB	4	C		63		F H
MCMA	08	1442E		1501	N19	W86	1.000	15126	2.2	190	SN		C	1449			D
RAMY	08	1449	1450U	1455	N17	E73	.969		14.1	6	SN	4	C		13		DE
HTPR	08	1506	1512	1520	N21	W05	.463		8.3	14	SF		C	1512	20	.2	
HTPR	08	1555	1602	1608	N13	E37	.662		11.4	13	SF		C	1602	20	.2	E
RAMY	08	1603	1605	16100	N15	E40	.706		11.7	70	SB	4	C		56		F H
MCMA	08	1620	1622	16240	N19	W87	1.000	15126	2.2	40	SN		C	1622			D
RAMY	08	1629	1631	1647	N25	W 7	.528		8.2	18	SN	4	C		59		
MCMA	08	1640E		16540	N27	W10	.567	15134	7.9	140	SF		C	1640	50	.6	E
RAMY	08	1638	1640	1643	N15	E44	.748	15139	12.0	5	1N	4	C		89		H
MCMA	08	1640E		16540	N14	E40	.701	15139	11.7	140	SN		P	1640	80	1.1	EL
RAMY	08	1756	1759	1802	N15	E39	.695		11.7	6	SB	3	C		29		
RAMY	08	1906	1907	1910	N15	E38	.684		11.6	4	SB	3	C		23		
RAMY	08	1946	1948	1950	N15	E38	.684		11.7	4	SB	3	C		146		
PALE	08	1958	2001	2020	N13	E41	.707		11.9	22	SN	3	C		55		F
PALE	08	2002	2109	2315	N26	W10	.553		8.1	193	SF	3	C		73		F
PALE	08	2114	2116	2320	N13	E41	.707	15139	12.0	126	1B	3	C		290		F H
PALE	08	2317	0203	0257	N14	E48	.785	15139	12.6	220	1B	3	C		255		U F
PALE	08	2150	2152	2201	N21	W15	.513		7.8	11	SF	3	C		34		F
PALE	08	2325	0020	0135	N16	E36	.668		11.7	130	SN	3	C		130		DE F
MANI	09	0449	0450	05170	N14	E36	.656		11.9	280	SN	3	P		130	1.8	F
MANI	09	0504	0509	05280	N27	W12	.574		8.3	240	SN	3	P		150	1.9	F
MANI	09	0620E	0624	0630	N14	E37	.667		12.0	100	SN	3	P		140	2.0	F
MCMA	09	1511	1513	1519	N21	W14	.505	15135	8.6	8	SF		C	1513	25	.3	D
MCMA	09	1613	1617	1620	N18	W11	.445	15135	8.9	7	SF		C	1617	30	.3	E
MCMA	09	1739E		1745	N15	W12	.410	15135	8.8	60	SF		C	1739	25	.3	E
MCMA	09	1823	1824	18310	N21	W16	.519	15135	8.6	80	SN		C	1824	30	.3	E
MCMA	09	1825	1831	1920	N15	E28	.571	15139	11.9	55	1B		C	1831	160	2.0	EHY
MCMA	09	1857E		1907	S29	W26	.553	15132	7.8	100	SF		P	1857	30	.4	E

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OBSERVATORY	OBSERVED UT				LOCATION					DURATION	IMPORTANCE	OBS.			MEASUREMENTS			REMARKS
	DATE FEB	START	MAX. PHASE	END	APPROX. LAT.	APPROX. MER. DIST.	CENTRAL DISTANCE	MCMATH PLAGE REGION	CMP DAY	MIN.		CORD.	TYPE		TIME UT	MEAS. AREA Mill. of Disk	CORR. AREA Sq. Deg.	
MCMA	09	1926	1930	1954	N28	W18	.619	15134	8.5	28	SB		C		1930	125	1.7	E
MANI	09	2256E	2256U	2307D	N14	E27	.552	15139	12.0	110	1F	2	P			350	4.4	FE
MANI	10	0019	0026	0055	N14	E23	.505	15139	11.7	36	1B	3	P			320	3.9	FE
MANI	10	0217	0221	0240	N14	E25	.528	15139	12.0	23	1N	3	P			200	2.4	F
MANI	10	0522	0525	0554	N14	E22	.494		11.9	32	SF	3	P			60	.7	F
MANI	10	0659	0702	0717	N12	E15	.397		11.4	18	SN	3	P			150	1.7	
MCMA	10	1716E	1739	1808D	N16	E16	.456	15139	11.9	520	1B		C		1739	300	3.4	EKL
MCMA	10	1835E		1858D	N14	E08	.367	15139	11.4	23D	SN		C		1835	80	.9	E
MCMA	10	1906E	1911	2015D	N25	W35	.720	15134	8.2	69D	SF		P		1911	80	1.2	E
MCMA	10	1911	1934	2015D	N14	E08	.367	15139	11.4	64D	SN		C		1934	75	.9	EFK
MANI	11	0110	0112	0140	N27	W40	.775		8.0	30	SF	3	P			70	1.1	
MANI	11	0203	0205U	0221	N14	E05	.351		11.5	18	SN	3	P			80	.9	F
MANI	11	0205	0208	0218	N17	W25	.555		9.2	13	SF	3	P			40	.5	
MANI	11	0320	0324	0343	N13	W12	.381		10.2	23	SN	3	P			70	.8	
MANI	11	0753	0755	0806	N13	E11	.372		12.2	13	SN	3	P			160	1.8	
MANI	11	0815	0818	0832	N12	E11	.358		12.2	17	SN	3	P			120	1.3	
MCMA	11	1407	1409	1415	N15	W08	.381	15139	11.0	8	SF		C		1409	60	.7	EH
CATA	11	1408	1410	1415	N14	W09	.372		10.9	7	SB	2	C		1410	140	1.5	H
MCMA	11	1425	1428	1448	N14	E07	.360	15139	12.1	23	1B		C		1428	200	2.2	EL
CATA	11	1429	1429	1438	N14	E06	.355	15139	12.1	9	1B	2	C		1429	224	2.4	
MCMA	11	1701	1705	1750	N13	W05	.335	15139	11.3	49	SN		C		1705	100	1.1	EL
MCMA	11	1815E	1820	1828D	N15	W10	.393	15139	11.0	13D	SN		C		1820	40	.5	EL
MCMA	11	1846E		1848	N18	W08	.426	15139	11.2	2D	SN		C		1846	25	.3	EL
MCMA	11	1940		2019D	N14	W07	.360	15139	11.3	39D	SN		C		1950	150	1.6	E
MCMA	11	1942	1952	2019D	N28	W43	.805	15134	8.6	37D	SN		C		1952	40	.7	E
MANI	11	2350E	2350U	0019	N13	W07	.345	15139	11.5	29D	1B	3	P			300	3.3	F
MANI	12	0002E	0002U	0030	N18	E00	.404		12.0	28D	SF	3	P			80	.9	
MANI	12	0138	0144	0150	N18	W11	.442		11.2	12	SF	3	P			150	1.7	
HTPR	12	1103	1105	1205	N13	W19	.449		11.0	62	SB		C		1105	120	1.2	
CATA	12	1105E	1105	1105D	N11	W17	.405	15139	11.2		1B	2	P		1105	196	2.2	
HTPR	12	1153	1201	1205	N15	W22	.503		10.8	12	SF		C		1201	20	.2	
HTPR	12	1307	1310	1346	N14	E04	.346	15139	12.8	39	1N		C		1310	320	3.2	EK
MCMA	12	1332E		1348	N14	W05	.350	15139	12.2	16D	SN		C		1332	100	1.1	E
MCMA	12	1405E		1430D	N28	W53	.877	15134	8.6	25D	SF		C		1411	50	1.2	E
MCMA	12	1520E		1600D	N14	W15	.420	15139	11.5	48D	SF		C		1525	120	1.4	E
MCMA	12	1603	1611	1618D	N14	W15	.420	15139	11.5	15D	SN		C		1611	100	1.2	E
MCMA	12	1830E		1837D	N14	W08	.365	15139	12.2	7D	SN		C		1832	50	.6	E
MCMA	12	1846	1853	1902D	N13	W17	.428	15139	11.5	16D	1B		C		1853	175	2.0	EKL
MANI	13	0139	0143	0400	N13	W24	.505	15139	11.3	141	1N	3	P			180	2.1	F
MANI	13	0139	0151	0400	N13	W24	.505	15139	11.3	141	1B	3	P			200	2.4	
MANI	13	0140	0143	0400	N19	W14	.475		12.0	140	SF	3	P			100	1.2	
MANI	13	0140	0150	0400	N19	W14	.475	15139	12.0	140	1B	3	P			280	3.3	
MANI	13	0408	0414	0422	N13	W32	.601		10.8	14	SN	3	P			120	1.6	
HTPR	13	0818E	0819	0849	N14	W07	.358		12.8	31D	SN		C		0819	120	1.2	EK
MANI	13	0822E	0824	0836	N14	W14	.409		12.3	14D	SN	3	P			180	2.1	F
MANI	13	0836E	0840	0840D	N14	W31	.596		11.0	4D	SF	3	P			80	1.0	
MANI	13	0836	0837	0840D	N08	W25	.477		11.5	4D	SF	3	P			40	.5	
HTPR	13	0858	0859	0902	N14	W31	.596		11.0	4	SN		C		0859	20	.2	
HTPR	13	0948	0950	1002	N14	W31	.596		11.1	14	SF		C		0950	10	.1	
HTPR	13	1036	1037	1045	N10	W27	.518		11.4	9	SB		C		1037	50	.6	E
HTPR	13	1330	1333	1342	N12	W20	.449		12.1	12	SN		C		1333	40	.4	E
HTPR	13	1451E		1456D	N11	W28	.538		11.5	5D	SF		C		1454	20	.2	
HTPR	13	1451E		1456D	N16	W39	.699		10.7	5D	SF		C		1454	20	.2	
MANI	13	2325E	2325U	2340D	N13	W32	.601		11.6	15D	SN	3	V			60	.8	F
MANI	13	2330E	2331	2338D	N18	W37	.689		11.2	8D	SN	3	V			50	.7	
HTPR	14	1110	1112	1140	N12	W41	.700		11.4	30	SN		C		1112	140	1.8	EK
CATA	14	1115	1120	1145	N10	W40	.680		11.5	30	SN	2	C		1120	112	1.5	
HTPR	14	1124	1127	1143	N14	W47	.773		11.0	19	SN		C		1127	20	.3	
HTPR	14	1124	1127	1150	N11	W46	.752		11.0	26	SN		C		1127	20	.3	
CATA	14	1130	1135	1200	N09	W46	.745		11.0	30	SB	2	C		1135	56	.8	
CATA	14	1225	1230	1240	N15	W48	.787		10.9	15	SB	2	C		1230	56	.9	
HTPR	14	1225	1227	1232	N16	W51	.818		10.7	7	SF		C		1227	10	.2	
HTPR	14	1228	1230	1233	N12	W43	.723		11.3	5	SF		C		1230	20	.3	
MCMA	14	1420	1436	1445	N17	W44	.755	15139	11.3	25	SN		C		1435	60	1.0	H
HTPR	14	1421	1428	1442	N17	W45	.765		11.2	21	SF		C		1428	10	.1	
CATA	14	1430E	1435	1435D	N16	W44	.751		11.3	5D	SB	2	P		1435	112	1.7	
RAMY	14	1435	1437	1439	N16	W46	.771	15139	11.2	4	SN	3	C			32		

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OBSERVATORY	OBSERVED UT DATE FEB	START	MAX. PHASE	END	LOCATION APPROX. LAT.	APPROX. MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMP DAY	DURATION — MIN.	IMPORTANCE	OBS. CORD.	OBS. TYPE	MEASUREMENTS TIME — UT	MEAS. AREA Mill. of Disk	CORR. AREA Sq. Deg.	REMARKS
RAMY	14	1529	1532	1536	N27	E66	.949		19.6	7	SB	3	C		28		
MCMA	14	1529	1530	1540	N27	E68	.958	15153	19.7	11	SN		C	1530	30	1.2	E
HTPR	14	1530	1532	1540	N28	E68	.959		19.7	10	SN		C	1532	50	1.1	E
RAMY	14	1620	1623	1626D	N14	W39	.687	15139	11.8	6D	SN	3	V		28		
RAMY	14	1620	1623	1632	N13	W42	.716	15139	11.5	12	SN	3	C		28		F
MCMA	14	1720	1722	1745	N12	W48	.776	15139	11.1	25	SN		C	1722	100	1.7	E
PALE	14	1754	1807	1823	N15	W42	.725		11.6	29	SN	3	C		60		DE
PALE	14	1754	1758	1823	N15	W42	.725		11.6	29	SF	3	C		30		DE
PALE	14	1853	1909	1954	N15	W43	.736		11.6	61	SN	3	C		36		DE
RAMY	14	2001	2004	2021	S32	E12	.479		15.7	20	SN	3	C		41		
RAMY	14	2046	2047	2055	N14	W42	.720		11.7	9	SB	3	C		74		
RAMY	14	2115	2117	2124	S30	W10	.439		14.1	9	SN	3	C		34		
MANI	15	0405E	0405U	0424	N11	W52	.813		11.3	19D	SN	3	V		80	1.4	F
MANI	15	0720E	0720U	0725D	N14	W48	.783		11.7	5D	SF	2	V		30	.5	
BUCA	15	0738		0840	N17	W45	.765		11.9	62	SF		C	0753	53	.9	E
BUCA	15	0746		0811	N15	W49	.796		11.6	25	SN		C	0753	64	1.1	
CATA	15	0750	0755	0835	N14	W48	.783	15139	11.7	45	1B	2	C	0755	151	2.5	
MONT	15	0752E	0756	0845	N15	W47	.776		11.8	53D	SN		C	0756	150		
MANI	15	0753E	0755	0845D	N15	W46	.766		11.9	52D	SF	2	V		80	1.3	F
HTPR	15	0748E		0808	N13	W36	.647		12.6	20D	SN		C	0753	50	.6	E
HTPR	15	0748E		0830	N16	W32	.620		12.9	42D	SN		C	0751	40	.4	E
MONT	15	0906	0915	0932	N11	W56	.850		11.2	26	SN		C	0915	70		E
HTPR	15	0919	0927	0937	N28	E55	.889		19.5	18	SF		C	0927	20	.3	E
MONT	15	0923	0927	0941	N27	E53	.872		19.4	18	SF		C	0927	40		D
MONT	15	1005	1012	1032	N34	E60	.934		19.9	27	SN		C	1012	60		E
HTPR	15	1006		1020D	N33	E56	.911		19.6	14D	SF		C	1010	20	.3	E
TEHR	15	1012E	1015	1032	N27	E55	.886		19.6	20D	SB	2	C		63		
MONT	15	1048	1051	1108	N15	W52	.824		11.6	20	SN		C	1051	100		EF
MONT	15	1110	1113	1120	N18	W41	.729		12.4	10	SF		C	1113	60		E
TEHR	15	1116E	1121	1126	N18	W42	.740		12.3	10D	SB	2	C		95		U F
MONT	15	1114	1124	1134	N32	E58	.919		19.8	20	SF		C	1124	60		E
MONT	15	1129	1137	1146	N15	W57	.867		11.2	17	SF		C	1137	20		D
RAMY	15	1334	1343	1349	N14	W51	.812		11.7	15	SB	3	C		18		
MONT	15	1345	1348	1404	N16	W51	.818		11.7	19	SB		C	1348	80		E
RAMY	15	1350E	1352	1423	N14	W51	.812	15139	11.8	33D	SN	3	C		57		
RAMY	15	1458	1458	1502	N32	E57	.913		19.9	4	SB	3	C		30		
RAMY	15	1534	1537	1542	N32	E56	.908	15153	19.8	8	SN	3	C		23		
RAMY	15	1534	1535	1540D	N32	E56	.908	15153	19.8	6D	SN	3	V		18		
MCMA	15	1534	1539	1545	N34	E60	.934	15153	20.1	11	SF		C	1539	30	.8	E
RAMY	15	1652	1656	1658	N32	E56	.908		19.9	6	SB	3	C		15		DE
MCMA	15	1710E		1723D	N15	W53	.833	15139	11.7	13D	SN		P	1715	35	.7	E
RAMY	15	1838	1841	1858	N32	E55	.902	15153	19.9	20	SN	3	C		173		DE H
PALE	15	1838	1841	1858	N31	E54	.893	15153	19.8	20	2N	3	C		183		DE
MCMA	15	1843E		1852D	N34	E56	.914	15153	20.0	9D	1N		P	1843	110	2.6	EL
PALE	15	1858	1858	1913	N15	W56	.859		11.6	15	SN	3	C		20		DE
PALE	15	1915	1916	1919	S32	W 1	.444		15.7	4	SF	3	C		22		DE
RAMY	15	1916	1916	1933	S33	E 4	.464		16.1	17	SF	4	C		21		H
RAMY	15	1939	1941	1944	N32	E54	.896		19.9	5	SB	4	C		29		DE
PALE	15	2217E	2237U	2253	N16	W49	.800	15139	12.3	36D	2N	3	C		184		DE
PALE	15	2330	0017	0036	N18	W55	.859		11.9	66	SB	3	C		126		FDE
MANI	15	2333E	2334	2358D	N15	W56	.859		11.8	25D	SF	2	V		50	1.0	F
MANI	16	0622E	0622U	0641	N17	W52	.830	15139	12.4	19D	1N	2	V		250	4.5	
RAMY	16	1329	1330	1332	N33	E40	.810		19.6	3	SB	3	C		26		
RAMY	16	1400	1413	1440D	N25	W30	.672	15155	14.3	40D	SN	3	C		43		
RAMY	16	1404	1405	1408	N12	W63	.907		11.9	4	SN	3	C		13		
RAMY	16	1447	1450	1455	N33	E39	.803		19.5	8	SN	3	C		18		
RAMY	16	1453	1460	1502	N12	W63	.907		11.9	9	SN	3	C		14		
RAMY	16	1531	1532	1544	N25	W30	.672		14.4	13	SB	3	C		22		
RAMY	16	1617	1619	1627	N25	W31	.681	15155	14.4	10	SN	3	C		19		
MCMA	16	1714E		1745	N27	W30	.690	15155	14.5	31D	SF		P	1714	30	.4	E
PALE	16	1802	1803	1810	S30	W34	.646		14.2	8	SN	3	C		25		DE
PALE	16	1803	1804	1808	S24	W26	.516		14.8	5	SN	3	C		25		DE
PALE	16	1822	1823	1828	N26	W25	.640		14.9	6	SN	3	C		24		DE
PALE	16	1836	1838	1847	N26	W30	.681		14.5	11	SN	3	C		49		DE
PALE	16	1911	1920	1941	N30	E38	.776		19.6	30	SN	3	C		21		DE
RAMY	16	1912	1915	1941	N33	E36	.783		19.5	29	SN	4	C		33		FDE
PALE	16	1921	1928	1936	N26	W30	.681		14.6	15	SN	3	C		64		DE
PALE	16	1940	1940	1951	N26	W30	.681		14.6	11	SB	3	C		76		DE F
RAMY	16	1940	1942	1951	N25	W33	.698		14.3	11	SB	3	C		46		DE
RAMY	16	1947	1951	1953	N33	E36	.783		19.5	6	SN	3	C		156		F

Hα SOLAR FLARES

FEBRUARY 1978

OBSERV-ATORY	OBSERVED UT				LOCATION					DURA-TION — MIN.	IM-POR-TANCE	OBS		MEASUREMENTS			REMARKS
	DATE FEB	START	MAX. PHASE	END	APPROX. LAT.	APPROX. MER. DIST.	CENTRAL DISTANCE	MCMATH PLAGE REGION	CMP DAY			CORD.	TYPE	TIME — UT	MEAS. AREA Mill. of Disk	CORR. AREA Sq. Deg.	
PALE	16	2011	2011	2017	N26	W30	.681		14.6	6	SN	3	C		30		DE
PALE	16	2022	2022	2026	N26	W30	.681		14.6	4	SN	3	C		24		DE
PALE	16	2027	2027U	2051D	N26	W31	.689		14.5	24D	SN	3	C		20		DE
PALE	16	2152E	2153U	2156	N16	W71	.959		11.6	4D	SN	3	C		25		F
PALE	16	2154E	2155	2210D	N26	W31	.689		14.6	16D	SN	3	C		35		F
┌PALE	16	2229	2250U	2311D	N27	W33	.714		14.5	42D	SF	3	C		31		F
└PALE	16	2229	2237U	2311D	N27	W33	.714		14.5	42D	SN	3	C		135		F
PALE	16	2330	2333	0036	N15	W55	.850		12.9	66	SN	3	C		80		FDE
PALE	16	2342	2343	2347	N27	W33	.714		14.5	5	SN	3	C		24		F
PALE	17	0007	0008	0020	N27	W33	.714		14.5	13	SN	3	C		43		F
PALE	17	0022	0023	0036	N27	W33	.714		14.5	14	SN	3	C		44		F
PALE	17	0109	0110	0129	N27	W34	.722		14.5	20	SF	3	C		123		F
┌PALE	17	0141	0143	0150	N10	W75	.971	15139	11.4	9	1B	3	C		206		FDE
└MANI	17	0144E	0144U	0155	N12	W75	.973	15139	11.4	11D	2N	3	P		360	9.2	F
MANI	17	0313E	0315	0325	N15	W65	.924	15139	12.3	12D	2B	3	V		280	5.9	
┌MANI	17	0525E	0527	0555D	N12	W77	.980	15139	11.5	30D	2F	2	V		320	7.8	
└MANI	17	0525E	0526	0539D	N15	W66	.930	15139	12.3	14D	1F	2	V		200	4.4	
HTPR	17	0844	0851	0856	N27	W40	.772		14.4	12	SF		C	0851	20	.2	E
HTPR	17	0944	0946	0955	N14	W73	.966		11.9	11	SF		C	0946	10		
┌RAMY	17	1340E	1343U	1349D	N13	W71	.956	15139	12.2	9D	1N	3	C		25		
└HTPR	17	1341		1342D	N14	W75	.974		11.9	1D	SF		C	1342	20		E
RAMY	17	1400	1401	1406D	S32	W44	.753		14.3	6D	SN	3	C		22		
┌PALE	17	1758	1808	1912	N25	W40	.759		14.7	74	SN	3	C		65		F
└RAMY	17	1813	1826	1918	N23	W47	.809		14.2	65	SN	3	C		22		F
RAMY	17	1921	1927	1946	N23	W47	.809		14.3	25	SN	2	C		45		F
┌PALE	17	2215E	2226U	2245D	N25	W44	.793		14.6	30D	SN	3	C		75		DE
└PALE	17	2317E	2321U	2338	N25	W44	.793		14.7	21D	SN	3	C		58		DE
PALE	17	2344	2346U	0010	N25	W45	.802		14.6	26	SN	3	C		99		DE F
PALE	18	0040	0045U	0059	N25	W45	.801		14.7	19	SN	3	C		63		DE F
PALE	18	0211	0216	0219	N25	W46	.809		14.6	8	SN	3	C		31		DE F
PALE	18	0317	0322	0348D	N25	W47	.818		14.6	31D	SN	3	C		115		DE F
MONT	18	0804	0806	0810	N28	W55	.888		14.2	6	SF		C	0806	50		E
RAMY	18	1303	1304	1311	S25	E61	.879		23.1	8	SF	3	C		16		
MCMA	18	1447		1530	N21	E80	.992	15161	24.6	43	SF		C	1450			EK
MCMA	18	1613	1616	1625	N21	E80	.992	15161	24.7	12	SN		C	1616			
MCMA	18	1925	1926	1926D	S25	E60	.871	15156	23.3	1D	SF		C	1926	20	.4	D
RAMY	18	1927	1928	1929	N20	E40	.729		21.8	2	SN	3	C		32		
MCMA	18	2000E		2013D	N28	W58	.907	15155	14.5	13D	SN		C	2001	50	1.4	E
RAMY	19	1131	1133	1146	N25	W65	.940		14.6	15	SN	2	C		37		
┌MCMA	19	1320E		1600	N28	W67	.954	15155	14.5	160D	SN		C	1320	40	1.6	E
└MCMA	19	1453E	1454	1457	N23	E68	.952	15161	24.7	4D	SF		C	1454	20	.7	D
MCMA	19	1727	1729	1745	N32	E06	.612	15153	20.2	18	SF		C	1729	50	.7	E
PALE	20	0007	0010	0015	N22	E59	.897		24.4	8	SB	3	C		34		DE
RAMY	20	1529E	1529U	1532D	N24	E50	.837		24.4	3D	SN	2	C		18		
CATA	20	1530E	1540	1556	N28	W07	.558		20.1	25D	SB	2	P	1540	56	.7	
RAMY	20	1609	1610	1625D	N37	E73	.984	15162	26.1	16D	2B	3	C		176		
RAMY	20	1752	1752	1801	N37	E72	.982		26.1	9	SN	3	C		11		
CATA	21	0730	0735	0745	N27	W90	1.001	15155	14.6	15	1N	2	C	0735	56		
CATA	21	0805	0805	0820D	N27	W90	1.001	15155	14.6	15D	1N	2	P	0805	73		
MCMA	21	1518	1520	1532	N23	E40	.745	15161	24.6	14	SF		C	1520	30	.5	DH
RAMY	21	1521	1522	1526	N21	E34	.674		24.2	5	SN	3	C		19		
PALE	21	2252	2300	2330	N37	E60	.939	15162	26.5	38	2N	3	C		334		Y H
PALE	21	2301	2301	2302	N20	E30	.626		24.2	1	SN	3	C		24		DE
PALE	22	0008	0009	0010	N20	E29	.615		24.2	2	SN	3	C		34		DE
CATA	22	1255	1255	1310	N16	W01	.359		22.5	15	SN	2	C	1255	56	.6	
┌MCMA	22	1722	1733	1752	N22	W12	.492		21.8	30	SF		C				
└MCMA	22	1722	1724	1752	N22	W12	.492	15154	21.8	30	SF		C	1733	60	.7	EK
┌MCMA	22	1826	1833	1905	N22	W12	.492	15154	21.9	39	SN		C	1833	60	.7	E
├RAMY	22	1833	1835	1859	N20	W13	.471	15154	21.8	26	1N	2	C		90		DE
├RAMY	22	1833	1835	1845D	N20	W13	.471	15154	21.8	12D	1N	2	V		90		DE
└PALE	22	1834	1835U	1840D	N20	W13	.471		21.8	6D	SB	3	C		82		DE
MANI	23	0225	0230	0235D	N20	W15	.485		22.0	10D	SF	2	P		80	1.0	F
MONT	23	1011	1012	1017	N35	W43	.837		20.2	6	SF		C	1012	50		D
MCMA	23	1323E		1552D	N21	E14	.490	15161	24.6	149D	SN		P	1323	150	1.8	BE
MCMA	23	1323E		1340D	S26	W04	.365	15156	23.3	17D	SN		P	1325	50	.5	E

Hα SOLAR FLARES

FEBRUARY 1978

OBSERVATORY	OBSERVED UT				LOCATION					DURATION — MIN.	IMPORTANCE	OBS.		MEASUREMENTS			REMARKS
	DATE FEB	START	MAX. PHASE	END	APPROX. LAT.	APPROX. MER. DIST.	CENTRAL DISTANCE	MCMATH PLAGE REGION	CMP DAY			COORD.	TYPE	TIME — UT	MEAS. AREA Mill. of Disc	CORR. AREA Sq. Deg.	
HCMA	23	1420	1421	1430	S26	W04	.365	15156	23.3	10	SF		C	1421	58	.5	E
PALE	23	1747E	1748U	1756	N22	E 6	.463		24.2	9D	SN	3	C		44		DE
PALE	23	1852E	1855	1900	N24	E68	.952		28.9	8D	SN	3	C		19		DE
MANI	23	2320E	2320U	2327D	N20	E04	.427		24.3	7D	SF	3	V		30	.4	F
PALE	23	2342E	2346U	2353	N20	E 3	.425		24.2	11D	SN	3	C		25		DE
PALE	24	0101	0104	0105	N20	E 3	.423		24.3	4	SN	3	C		20		F
PALE	24	0241	0243	0256	N20	E 2	.422	15161	24.3	15	1N	3	C		173		FDE
PALE	24	0302	0303	0307	N20	E 1	.421		24.2	5	SN	3	C		45		F
MANI	24	0739E	0740	0745	N19	W04	.410		24.0	6D	SF	2	P		100	1.2	
PALE	24	2003	2005	2010	N18	W12	.434		23.9	7	SB	3	C		146		DE
PALE	24	2050	2052	2102	N18	W12	.434		24.0	12	SN	3	C		67		DE
PALE	24	2212E	2213U	2217	N20	W 8	.440		24.3	5D	SN	3	C		25		F
RAMY	25	1418	1421	1430D	N17	W22	.511		23.9	12D	SB	3	C		30		DE S
RAMY	25	1449	1450	1509	N18	W22	.522	15161	24.0	20	2N	3	C		241		U F
CATA	25	1455E	1455	1515	N21	W20	.536		24.1	20D	SB	2	P	1455	140	1.7	
PALE	25	1916	1920	1926	N18	W24	.542		24.0	10	SN	3	C		36		F
RAMY	25	1924	1925	1931	N19	W19	.504		24.4	7	SN	3	V		48		
RAMY	25	1924	1925	1931	N19	W19	.504		24.4	7	SN	1	C		48		
RAMY	25	1951	1956	2011	S25	E64	.902		30.6	20	SN	2	C		62		
PALE	25	2113	2122	2128	N18	W24	.542		24.1	15	SN	3	C		132		F
PALE	25	2120	2122	2128	N20	W21	.534		24.3	8	SN	3	C		132		F
PALE	25	2153	2156	2212	N20	W21	.534		24.3	19	SF	3	C		69		HDE
PALE	25	2153	2205	2212	N20	W21	.534	15161	24.3	19	1B	3	C		215		HDE
PALE	25	2242	2310	2343	N20	W22	.543		24.3	61	SN	3	C		185		DE F
PALE	26	0027	0029	0034	N20	W22	.542		24.4	7	SN	3	C		102		DE F
PALE	26	0104	0104	0125	N20	W23	.551	15161	24.3	21	1B	3	C		289		DE F
PALE	26	0231E	0232U	0243D	N20	W23	.551		24.4	12D	SB	3	C		102		DE
HTPR	26	1250	1300	1323	N16	E31	.602		28.9	33	SF		C	1300	30	.3	
HTPR	26	1251	1256	1314	S16	E14	.306		27.6	23	SF		C	1256	20	.2	E
HTPR	26	1309	1311	1319	N17	W39	.697		23.6	10	SF		C	1311	18	.1	
RAMY	26	1412	1414	1419	N18	W36	.671	15161	23.9	7	SN	3	C		34		
HTPR	26	1413E		1422	N18	W39	.703		23.7	9D	SN		C	1416	40	.4	B
RAMY	26	1419	1421	1428	S25	E54	.825		30.6	9	SB	3	C		18		
HCMA	26	1421E		1440	S24	E57	.849	15170	30.9	19D	SN		C	1424	40	.8	E
RAMY	26	1719	1721	1810	S25	E54	.825		30.8	51	SN	3	C		47		H
PALE	26	2008	2009	2019	N20	W33	.653		24.4	11	SN	3	C		55		F
RAMY	26	2043	2102	2117D	S25	E52	.807		30.8	34D	SB	2	C		87		
PALE	26	2104	2108	2112	S26	E51	.800		30.7	8	SN	3	C		32		F
RAMY	26	2049	2058	2107	N19	W35	.667		24.2	18	SN	2	C		60		
MANI	26	2331E	2331U	2340	N20	W34	.663		24.4	9D	SF	3	P		80	1.2	F
CATA	27	0850	0850	0855	N18	W60	.893		22.9	5	SN	2	C	0850	56	1.3	
WEND	27	1223		1237	N17	W48	.789		23.9	14	SN						
PALE	27	1809	1811	1818	N37	W53	.902		23.8	9	SN	3	C		23		F
PALE	27	1809	1811	1818	N37	W13	.686		26.8	9	SN	3	C		23		F
PALE	27	1902	1906	1909	N37	W13	.686		26.8	7	SF	3	C		51		F
PALE	27	1902	1903	1909	N37	W13	.686		26.8	7	SN	3	C		26		F
PALE	27	1932	1935	1953	N39	W14	.713		26.8	21	SN	3	C		54		F
PALE	27	1947	1948	2040	S29	E25	.559		29.7	53	SN	3	C		21		F
PALE	27	2138	2139	2142	N39	W15	.716		26.8	4	SN	3	C		24		F
PALE	27	2145	2147	2151	N20	W50	.818		24.2	6	SN	3	C		16		F
PALE	28	0147	0152	0207	N39	W17	.722		26.8	20	SN	3	C		79		F
MANI	28	0149E	0150	0200D	N38	W17	.711		26.8	11D	SF	2	P		70	1.1	F
PALE	28	0306	0307	0309	N39	W18	.726		26.8	3	SN	3	C		38		F
CATA	28	0740E	0745	0755D	N21	W47	.795	15161	24.8	15D	1B	2	P	0745	168	2.9	
HTPR	28	1346	1348	1410	N15	E02	.335		28.7	24	SF		C	1348	20	.2	
HTPR	28	1511	1515	1525	N20	W13	.464		27.7	14	SF		C	1515	20	.2	E
HTPR	28	1558	1604	1612	S20	W18	.397		27.3	14	SF		C	1604	10	.1	

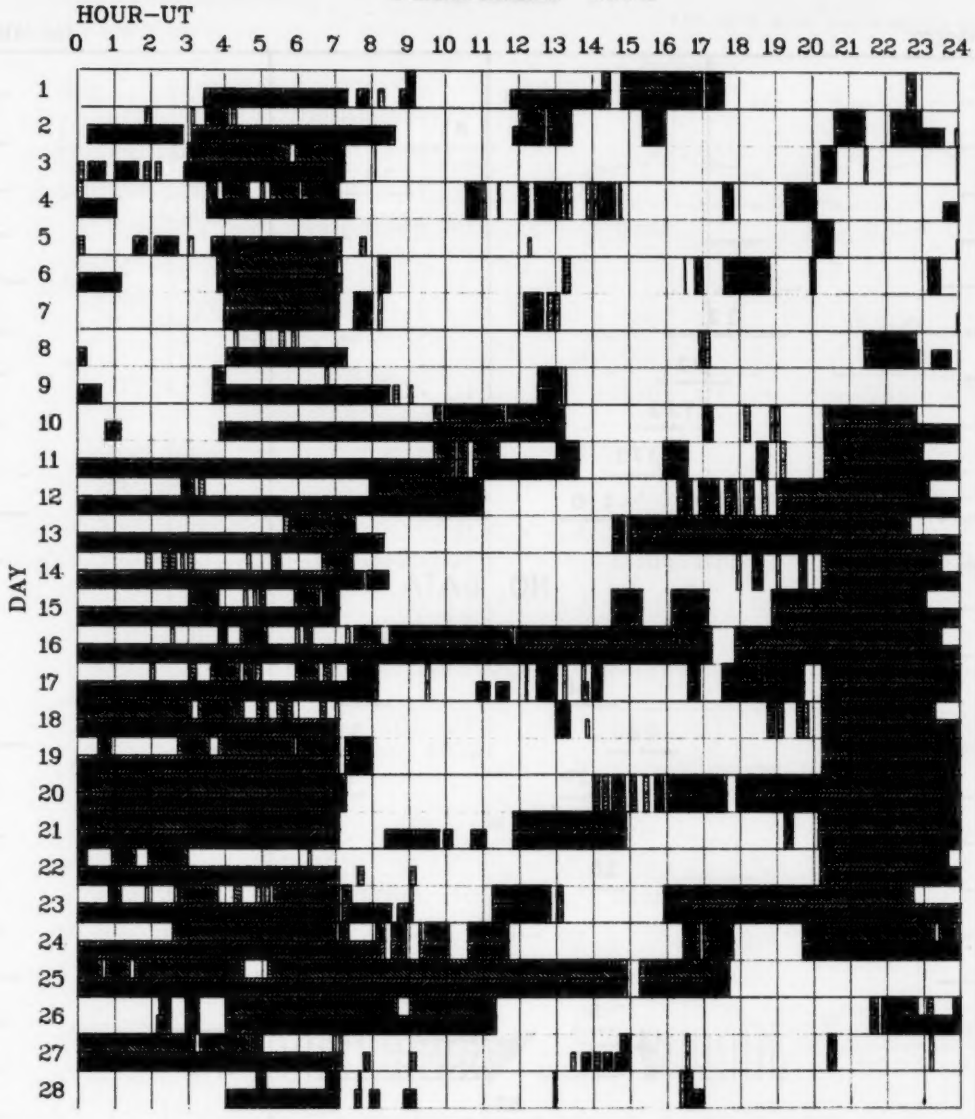
"Remarks":

A = Eruptive prominence whose base is less than 90° from central meridian.
B = Probably the end of a more important flare.
C = Invisible 10 minutes before.
D = Brilliant point.
E = Two or more brilliant points.
F = Several eruptive centers.
G = No visible spots in the neighborhood.
H = Flare accompanied by a high speed dark filament.
I = Active region very extended.
J = Distinct variations of plage intensity before or after the flare.
K = Several intensity maxima.
L = Existing filaments show signs of sudden activity.
M = White-light flare.
N = Continuous spectrum shows effects of polarization.
O = Observations have been made in the calcium II lines H and K.
P = Flare shows helium D_3 in emission.
Q = Flare shows the Balmer continuum in emission.
R = Marked asymmetry in Hα line suggests ejection of high velocity material.
S = Brightness follows disappearance of filament (same position).
T = Region active all day.
U = Two bright branches, parallel (||) or converging (Y).
V = Occurrence of an explosive phase: important and abrupt expansion in about a minute with or without important intensity increase.
W = Great increase in area after time of maximum intensity.
X = Unusually wide Hα line.
Y = System of loop-type prominences.
Z = Major sunspot umbra covered by flare.

INTERVALS OF NO FLARE PATROL OBSERVATION

FOR PRECEDING SOLAR FLARE TABLE

FEBRUARY 1978



Observatories included in total patrol:

Bucharest	Herstmonceux	Manila	Palehua	Upice
Catania	Istanboul	McMath-Hulbert	Ramey	Wendelstein
Haute Provence	Kandilli	Monte Mario	Tehran	

Times of no flare patrol are shown by the shaded area for each day divided into times of no cinematographic patrol (bottom half of day) and times of neither visual nor cinematographic patrol (top half of day).

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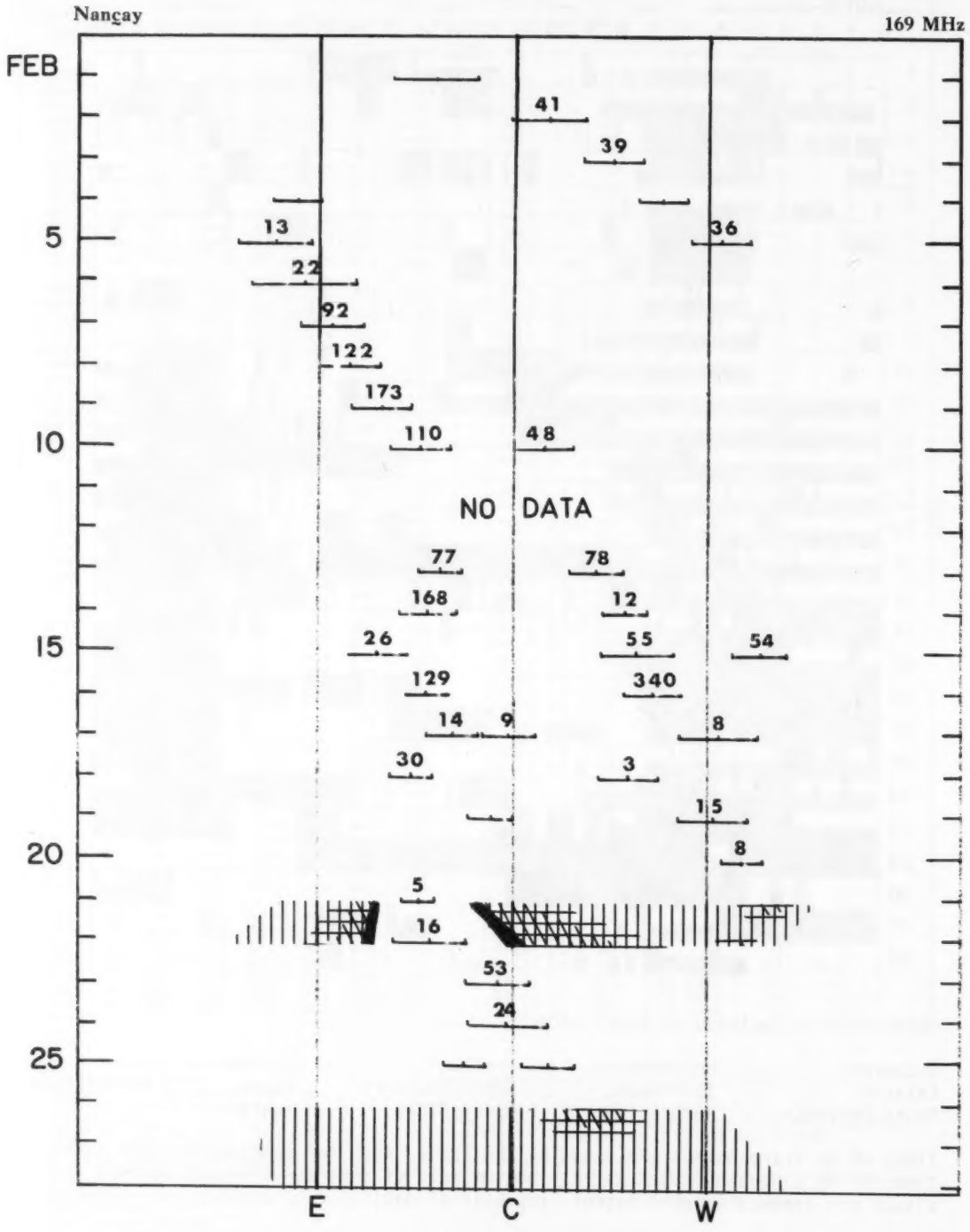
Feb 78

SOLAR RADIO EMISSION
INTERFEROMETRIC OBSERVATION

FEBRUARY 1978

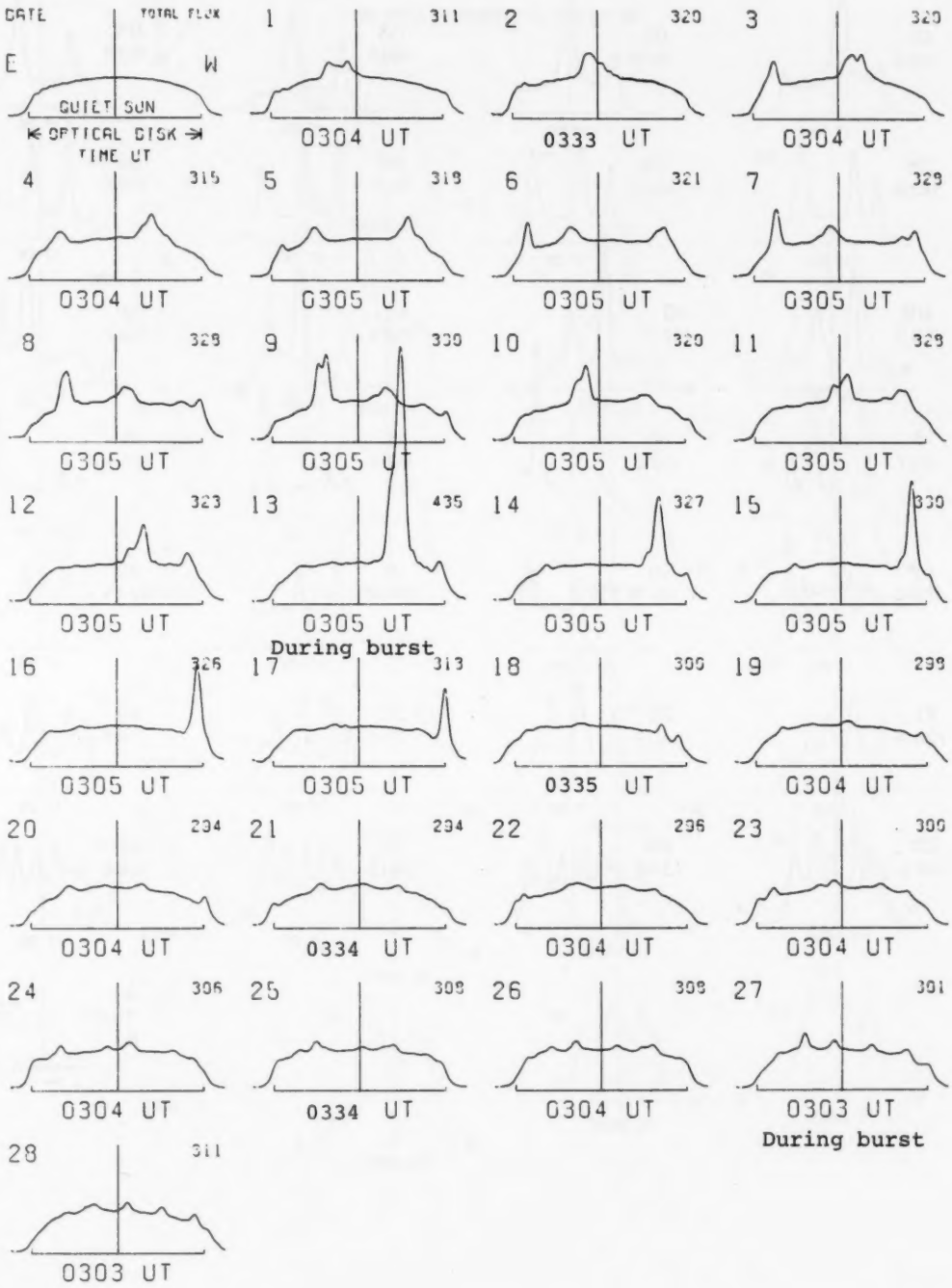


EAST-WEST SOLAR SCANS

FEBRUARY 1978

TOYOKAWA, JAPAN

3 CM
FAN BEAM WITH 1.1 MINUTES OF ARC



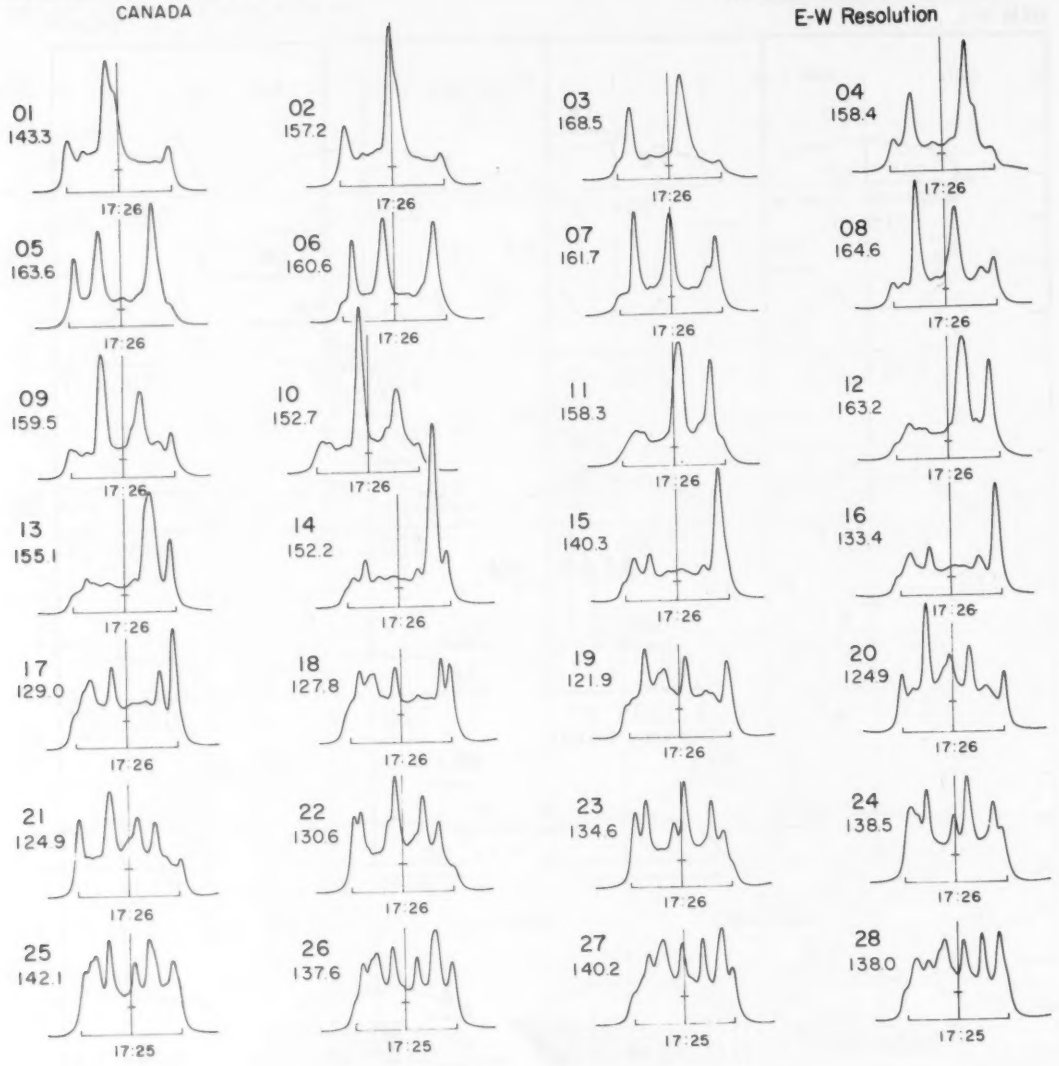
22
Feb 78

EAST-WEST SOLAR SCANS

FEBRUARY 1978

10·7cm
Fan Beam with 1·5 minutes of arc
E-W Resolution

ALGONQUIN RADIO OBSERVATORY
CANADA

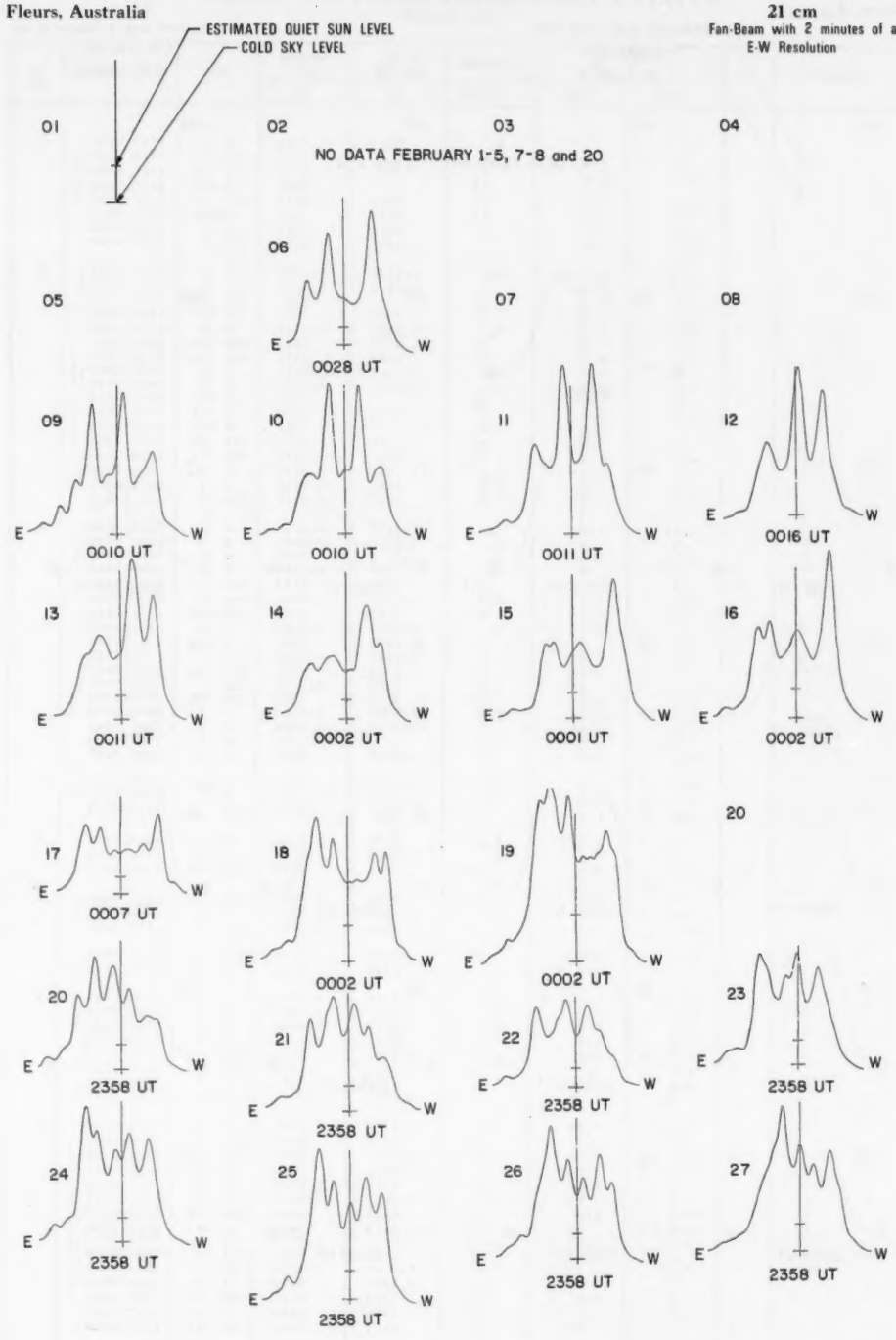


EAST-WEST SOLAR SCANS

FEBRUARY 1978

Fleurs, Australia

21 cm
Fan-Beam with 2 minutes of arc
E-W Resolution



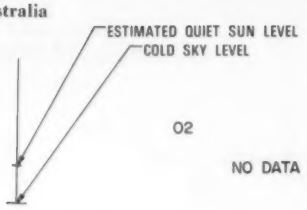
24
Feb 78

EAST-WEST SOLAR SCANS

FEBRUARY 1978

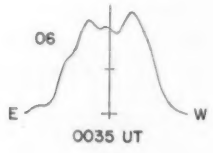
Fleurs, Australia

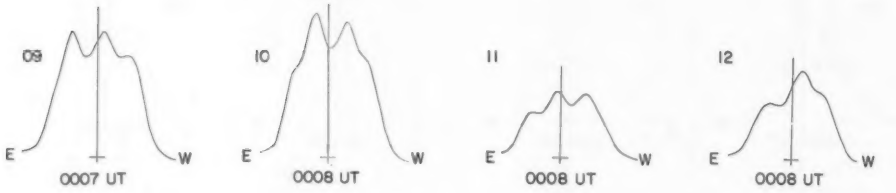
43 cm
Fan-Beam with 4 minutes of arc
E-W Resolution

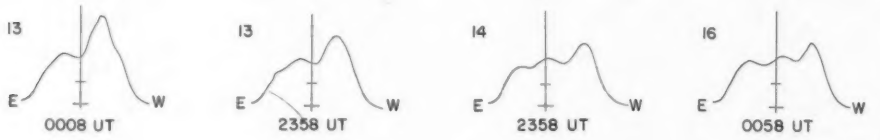


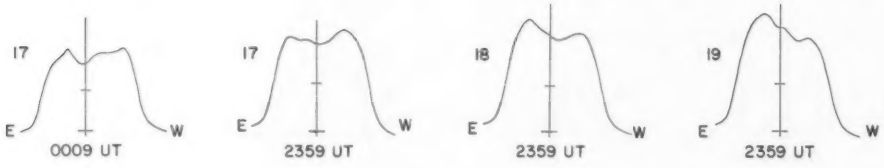
01 02 03 04

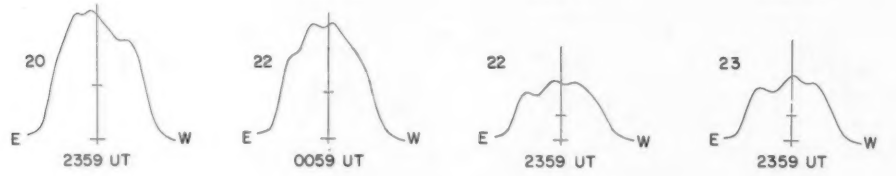
NO DATA FEBRUARY 1-5 and 7-8

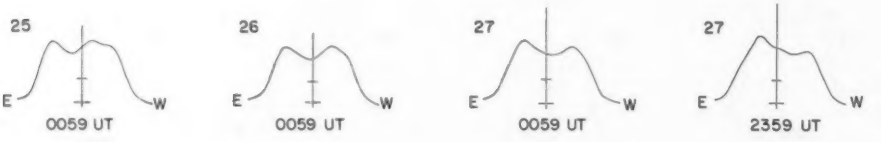












SOLAR RADIO EMISSION
SELECTED FIXED FREQUENCY EVENTS

FEBRUARY 1978

FEB 1978	FREQUENCY	STATION	TYPE	STARTING TIME	TIME OF MAXIMUM	DURATION	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1}		INT	REMARKS
				UT	UT	MINUTES	PEAK	MEAN		
1	2800	OTTA	8 S	1345.7	1346	.8	1	.5		
	2800	OTTA	27 RF	1443		122	2.8	2		
	2800	OTTA	24 R	1443	1520	37	2.8	1.4		
	2800	OTTA	24P R	1520		52	2.4			
	2800	OTTA	26 FAL	1612	1645	33	-2.8	-1.5		
	2800	OTTA	240AR	1817	1830	13	2.8			
	2800	OTTA	1 S	1822	1824	5	2.8	1.4		
	2695	PENT	2 S/F	2250	2250.1	2.5	9.4	4.8		
2	8800	MANI	3 S	0814.8	0816.5	3.2	147.8	97.2		
	2695	MANI	3 S	0814.8	0816.6	3	50.7	30.4		
	2800	OTTA	20 GRF	1340		75	2.2	1.6		
	2800	OTTA	240 R	1512	1530	18	2.8	1.4		
	2800	OTTA	8 S	1607.7	1608.2	.7	3.6	1.6		
	2800	OTTA	20 GRF	1720	1726	20	2	1		
	2800	OTTA	23 GRF	1815	1830	47	2.8	1.5		
	2800	OTTA	1 S	1823.6	1824.2	4.5	8.2	3		
	2695	SGMR	3 S	1824.2	1825.1	3.8	11.6	4.6		
	2800	OTTA	27F RF	1912		88	2.2	2		
	2800	OTTA	24 R	1912	1917	5	2.2	1.1		
	2800	OTTA	24P R	1917		73	2.2			
	2800	OTTA	26 FAL	2030	2040	10	-2.2	-1.1		
	2695	PENT	23 GRF	2043	2140	130	6.8	3.4		
	2800	OTTA	1 S	2121.3	2121.8	1.5	5.4	2.7		
	2695	PENT	1 S	2126.5	2127	1	2.4	1.2		
	2695	PENT	4 S/F	2328.5	2329	4	23	8		
3	2695	MANI	3 S	0446.4	0446.7	.4	15.1	10.1		
	8800	MANI	1 S	0446.5	0446.6	.2	4	2		
	2695	MANI	3 S	0749	0749.4	.6	37.8	22.6		
	8800	MANI	1 S	0749.2	0749.4	.4	8	4		I
	2800	OTTA	23 GRF	1540	1649	125	10	4		
	2800	OTTA	2 S/F	1608.2	1611.2	4.8	6.6	3.3		
	2800	OTTA	26A FAL	1840	1930	50	-6.2	-3.1		
	2800	OTTA	8 S	1916.5	1916.5	.1	5.4			
	2800	OTTA	240 R	1945	1958	13	3	1.5		
	2800	OTTA	2 S/F	2000	2001.9	4	8.4	2.8		
	2695	PENT	29 PBI	2004	2004	8	2	1		
	2695	PENT	4 S/F	2014.2	2016	7.8	56	12		
	2800	**OTTA**	**29 PBI**	**2022**	**2022**	**90**	**2.4**	**2.1**		
	2695	**SGMR**	**3 S**	**2015.2**	**2015.9**	**6.3**	**47.8**	**14.3**		**CONT**
	8800	**SGMR**	**3 S**	**2015.2**	**2015.9**	**2**	**31.1**	**9.3**		**CONT**
	2695	BOUL	2 SF	2216.5	2217	2.5	48	16		
	2695	PENT	1 S	2238	2238.8	3	3.6	1.6		
4	2800	OTTA	240 R	1517	1524.5	7.5	2.8	1.4		
	2800	OTTA	1 S	1524.9	1525.1	1	1.6	.6		
	2800	OTTA	22 GRF	1705	1800	170	7.8	3.9		
5	8800	MANI	8 S	0015.3	0016	1.2	341.8	76		
	2800	OTTA	8 S	1500.8	1500.8	.5	2	1		
	2800	OTTA	22 GRF	1715	1835	130	4.6	2.5		
6	2800	OTTA	21 GRF	1725	1755	90	3.2	2		
	2800	OTTA	1 S	1726.7	1727.7	1.5	2.2	1.1		
	2800	OTTA	1 S	1933.2	1933.3	1	2.2	.8		
7	2800	OTTA	20 GRF	1715	1720	17	3.2	1.6		
	2800	OTTA	8 S	2115	2115	.1	4.6			
8	8800	MANI	3 S	0356.8	0356.9	.5	47.3	28.3		
	2695	MANI	1 S	0836.5	0836.6	.2	4.4	1.4		
	8800	MANI	1 S	0836.5	0836.6	.2	9.4	4.7		
	2800	OTTA	3 S	1434.9	1435	1	10.8	2.7		
	2800	OTTA	20 GRF	1622	1632	70	4.8	2.4		
	2800	OTTA	22 GRF	1800	1810	40	3.2	2.2		
	2800	OTTA	3 S	1955.2	1956	7	28	6.8		
	2695	BOUL	3 S	1956.5	1957.5	2	53	18		
9	8800	MANI	3 S	0021.2	0021.5	.7	35.7	23.8		
	2800	OTTA	23 GRF	1330	1500	190	10.2	5.1		
	8800	SGMR	4 S/F	1400	1401	8	13.8	5.5		
	2695	SGMR	4 S/F	1400	1401.4	8	15.4	6.2		
	2800	OTTA	3 S	1400	1408	4	12.2	6		
	2800	OTTA	3 S	1443.2	1445.8	3.9	19	7		
	2800	**OTTA**	**29 PBI**	**1547**	**1547**	**10**	**5.2**	**2.6**		
	2695	**SGMR**	**3 S**	**1444**	**1446**	**10**	**22**	**8.8**		
	2695	SGMR	4 S/F	1558.8	1602.1	11.1	85.7	25.7		SWF
	2800	OTTA	4 S/F	1600	1602	10	66	16		
	8800	SGMR	4 S/F	1601.1	1601.8	4.7	225	67.5		SWF
	2695	BOUL	3 S	1602	1602.5	4	78	26		
	2800	OTTA	20 GRF	1640	1647	16	1.8	1		
	2800	OTTA	1 S	1802	1807	8	3	1.2		
	2800	OTTA	21 GRF	1820	1834	40	11			

SOLAR RADIO EMISSION
SELECTED FIXED FREQUENCY EVENTS
FEBRUARY 1978

FEB 1978	FREQUENCY	STATION	TYPE	STARTING TIME UT	TIME OF MAXIMUM UT	DURATION MINUTES	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1} PEAK	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1} MEAN	INT	REMARKS
	2695	SGMR	20 GRF	1823.5	1827.6	30.1	25.5	7.7		SWF
	8800	SGMR	20 GRF	1824.9	1828.5	33.1	13.1	3.9		SWF
	2800	OTTA	3 S	1826	1827.5	6	17.4	6		
	2695	BOUL	1 S	1827	1828	4	14	5		
	2800	OTTA	21 GRF	1922	1932	20	6	3		
	2695	SGMR	3 S	1926.4	1928.6	6.1	13.1	3.9		
	2800	OTTA	4 S/F	1927.5	1928.9	3	10	4		
	2695	SGMR	20 GRF	2101.8	2105.1	11.6	8.4	2.5		SWF
	2800	OTTA	1A S	2102	2106	10	9	2.5		
	8800	SGMR	3 S	2103.3	2104.7	6.7	16.7	5		SWF
	2800	OTTA	1 S	2104.6	2105	1	3.2	1.6		
	2695	PENT	240 R	2145	2203	18	11	3		
	2695	PENT	28 PRE	2238	2241	8.5	5.6			
	2695	PENT	3 S	2246.5	2251	16.5	79	24.6		
	2695	PENT	29 PBI	2303	2303	40	9	4.5		
	2695	BOUL	2 SF	2248	2252	7	53	18		
	2695	MANI	3 S	2250.3	2251	2.6	32.8	21.9		
10	2695	MANI	3 S	0044.3	0044.7	.9	13.1	8.8		
	8800	MANI	8 S	0044.3	0044.7	.7	132.6	88.4		I
	2800	OTTA	1 S	1656	1657	4	3	1.5		
	2800	OTTA	27A RF	1704		61	6.4	5.2		
	2695	PENT	24 R	1704	1714.5	10.5	6.4	2.1		
	2695	PENT	1 S	1705	1706	2	2.4	1.2		
	8800	SGMR	22 GRF	1709.6	1745.3	50.3	37.3	14.9		S,SWF
	2695	SGMR	22 GRF	1713.2	1745.7	47	17.6	7.4		S,SWF
	2800	OTTA	24P R	1714.5		36.5	6.4			
	2800	OTTA	1 S	1719	1721	5	5	2.4		
	2800	OTTA	1 S	1725	1728	6	3	2.5		
	2800	OTTA	1 S	1734.2	1736.7	5	3.4	1.7		
	2800	OTTA	45 C	1741	1746	6	12.6	5		
	2695	BOUL	45 C	1742.5	1743	5	21	7		
	2800	OTTA	26 FAL	1751	1805	14	-6.4	-2.1		
	2695	SGMR	20 GRF	2103	2111.6	34.3	57.5	23		
	2800	OTTA	21 GRF	2106	2124	120 D	17			
	8800	SGMR	20 GRF	2109.8	2117.1	19	32.7	13.1		
	2800	OTTA	4 S/F	2110.5	2111.6	4	41	10		
	2800	OTTA	45 C	2128	2128.8	4	13	3.2		
	2800	OTTA	3 S	2134	2136.3	4	10	2.5		
11	2695	MANI	3 S	0319.3	0319.9	3.3	44.4	29.6		
	8800	MANI	8 S	0319.5	0321.2	3.1	63.6	42.4		IG
	8800	MANI	3 S	0753	0753.3	3.6	79.5	53		IG
	2695	MANI	3 S	0753.1	0753.4	2.4	20.9	13.9		
	8800	MANI	3 S	0814.4	0814.7	1.5	53	35.3		IG
	2695	MANI	3 S	0814.5	0815	1.4	23.5	15.7		
	8800	MANI	3 S	0819.7	0820.5	3.7	238.5	159		
	2695	MANI	3 S	0820	0820.5	3.4	39.2	26.1		
	8800	SGMR	3 S	1232.1	1232.4	1.4	39	15.6		
	2695	SGMR	3 S	1232.3	1232.5	2.7	34.5	13.8		
	2800	OTTA	21 GRF	1350		120	6.2			
	2800	OTTA	3 S	1424.5	1427.3	9	106	21		
	2695	SGMR	3 S	1426	1427.5	6	117	46.9		
	8800	SGMR	3 S	1426.5	1427.5	4.5	445	17.8		
	2695	PENT	240AR	1650	1720	20	2.8	1.4		
	8800	SGMR	3 S	1659.9	1709	15.1	37.7	15.1		
	2695	SGMR	20 GRF	1701	1709	14	4	1.6		
	2695	PENT	1 S	1704	1704.5	2.5	2.2	1.1		
	2800	OTTA	23 GRF	1920	1955	225	10.4	5.2		
	2800	OTTA	48 F	1924.5	1929.7	7	3			
	2695	PENT	22 GRF	2135	2148	19	5.4	3		
	2695	PENT	21 GRF	2155	2159	15	2.8	1.4		
	2695	PENT	1 S	2157	2157.5	1	3.2	1.6		
	2695	PENT	1 S	2235.8	2237.5	5	2.8	1.4		
	2695	MANI	20 GRF	2344.5	2355 U	14.50	12.6	6		
12	2695	MANI	3 S	0137.7	0138.3	1.3	10.1	6.7		IG
	8800	MANI	3 S	0523	0523.1	.2	10.8	5.4		IG
	8800	SGMR	3 S	1307	1308.6	2.1	140	56.2		3,CONT
	2695	SGMR	3 S	1307.1	1308.6	2.2	69	27.6		3,CONT
	2800	OTTA	8 S	1532	1532.2	.5	2.6	1.3		
	8800	SGMR	1 S	1602.8	1603.2	1.2	9.9	4		CONT
	2800	OTTA	1 S	1603	1603.5	3	9.4	4.5		
	2695	SGMR	3 S	1603.1	1603.8	4.9	11.3	4.5		CONT
	2800	OTTA	28 GRF	1829	1831	17	3.2	1.8		
	2695	SGMR	3 S	1849.1	1849.2	1.1	32.5	14.5		CONT,SWF
	8800	SGMR	3 S	1849.1	1850.1	1.4	37.2	26.8		CONT,SWF
	2800	OTTA	4 S/F	1848.2	1849.1	8	27	7		
	2800	OTTA	23 GRF	1857	1929	280	16.2			
13	8800	MANI	3 S	0135 E	0202	60 D	317.3	212		NT
	2695	MANI	47 GB	0135 E	0205.5	60 D	737.1	491.4		
	2695	MANI	3 S	0826.5	0826.9	1	35.1	20.5		
	8800	MANI	1 S	0826.8	0827	.3	5.7	2.8		IG
	2800	OTTA	28 GRF	1328		210 D	11			

SOLAR RADIO EMISSION
SELECTED FIXED FREQUENCY EVENTS
FEBRUARY 1978

FEB 1978	FREQUENCY	STATION	TYPE	STARTING TIME UT	TIME OF MAXIMUM UT	DURATION MINUTES	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1} PEAK	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1} MEAN	INT	REMARKS
	2800	OTTA	27A RF	1645		255	4.4	4.1		
	2800	OTTA	24 R	1645	1652	7	4.4	2.2		
	2800	OTTA	24P R	1652		226	4.4			
	8800	SGMR	1 S	1728.6	1728.9	3.4	9.2	3.7		CONT
	2800	OTTA	23 GRF	1750	1900	145	18.6	6.2		
	2800	OTTA	8 S	1750.6	1750.8	.8	2.8	1.4		
	2800	OTTA	1 S	1821	1822	2	2.2	1.1		
	2800	OTTA	1 S	1856.5	1858	3	3	1.6		
	2695	SGMR	20 GRF	1908	1904.2	39	20	8		CONT,SWF
	8800	SGMR	20 GRF	1900.5	1904	33.5	26.7	10.7		CONT,SWF
	2800	OTTA	3 S	1903.7	1904	2	12.4	6		
	2800	OTTA	1 S	1915.5	1916	2	5.4	2.7		
	2800	OTTA	1 S	1919	1921.5	10	4.4	2.2		
	2695	PENT	26 FAL	2038	2100	22	-4.4	-2.2		
	2695	PENT	21 GRF	2120	2155	100	6	4.5		
	2695	PENT	45 C	2210.5	2211	5	9.4	3.5		
	2695	MANI	3 S	2322.2	2325.4	5.3	32.5	21.6		
	8800	MANI	3 S	2322.4	2325.5	5.2	42.8	28.5		
	2695	PENT	2 S/F	2324.2	2325.5	2	8.2	4.1		
	2695	PENT	1 S	2330.5	2331.6	2	5.4	2.5		
14	8800	MANI	3 S	0807.1	0807.5	.5	23.3	13.9		
	2695	MANI	1 S	0807.4	0807.5	.4	1	.6		
	2800	OTTA	1 S	1434.8	1435	1.5	1.6	.8		
	2800	OTTA	8 S	1507.5	1507.7	.5	1.4	.7		
	2800	OTTA	23 GRF	1717.5	1736	135	7.8	4		
	2695	SGMR	3 S	1718.2	1721.5	6.3	27.2	8.2		CONT
	8800	SGMR	3 S	1720.4	1721.3	1.6	20.2	6.1		CONT
	2800	OTTA	4 S/F	1721	1721.6	4	24.4	9		
	2800	OTTA	20 GRF	1855	1857	25	3.6	1.2		
	2800	OTTA	26 FAL	2045	2100	15	-2.8	-1.4		
	2695	PENT	20 GRF	2130.2	2143	30	2.8	2.4		
15	8800	MANI	3 S	0500.7	0501	.6	35.7	20.4		IG
	2695	MANI	1 S	0544.1	0544.3	.4	4.1	2		
	8800	MANI	3 S	0544.1	0544.3	.4	10.2	5.1		IG
	2695	MANI	3 S	0721	0721.8	1.5	10.3	6.1		
	8800	MANI	3 S	0721.5	0721.6	1	10.2	5.1		
	8800	MANI	3 S	0733.8	0734.3	1.9	30	20.4		
	2695	MANI	3 S	0733.9	0734.7	1.9	32.9	20.6		
	8800	MANI	8 S	0747.3	0748.2	5.5	153.3	102.2		I
	2695	MANI	3 S	0747.3	0748.7	5.7	84.4	55.6		
	2800	OTTA	21 GRF	1330	1400	80	6.4	3.2		
	2800	OTTA	3 S	1347.1	1348.3	7	20	5		
	2695	SGMR	3 S	1347.3	1348.3	5.7	23.8	9.5		S,CONT,SWF
	8800	SGMR	3 S	1347.4	1347.5	1.7	44.5	33.2		S,CONT,SWF
	2695	BOUL	1 S	1840.5	1841	2.5	3	1		
	2695	SGMR	1 S	2011.2	2013.2	4.2	3.6	1.4		CONT
	8800	SGMR	3 S	2011.3	2012.3	4.9	13.9	5.6		CONT
	2695	PENT	1 S	2012	2013	2	4.4	1.5		
	2695	BOUL	8 S	2013.5	2014	1.5	5	2		
	2695	PENT	8 S	2229	2229.2	.8	11.5			
	2695	BOUL	8 S	2229.5	2230	1.5	9	3		
	2695	BOUL	3 S	2236.5	2239	3.5	3	1		
16	2695	MANI	3 S	0016.6	0016.8	.4	18.2	5.1		
	8800	MANI	1 S	0016.6	0016.8	.4	9.8	4.9		I
	8800	MANI	3 S	0607.8	0610	7.2	71.5	45.9		IG
	2695	MANI	3 S	0607.8	0611.8	7.2	13.4	8		
	2800	OTTA	27AF RF	1320		150	3	2.4		
	2800	OTTA	24 R	1320	1400	40	3	1.5		
	2800	OTTA	24P R	1400		85	3			
	2800	OTTA	4 S/F	1522	1523	2	14.4	3.8		
	2695	SGMR	1 S	1522.3	1523	1.4	8.8	3.5		S,CONT
	2695	BOUL	8 S	1523	1524	2	43	14		
	2800	OTTA	26 FAL	1525	1550	25	-3	-2		
	2800	OTTA	21 GRF	1820	1940	150	6	3		
	2800	OTTA	1 S	2026.5	2027.2	3	3	1.5		
	2800	OTTA	4 S/F	2128	2132.5	9	29	9		
	8800	SGMR	20 GRF	2129.8	2132.3	42.20	36.6	11		CONT
	2695	SGMR	20 GRF	2130	2132.4	42 0	26.1	7.8		CONT
	2695	PENT	3 S	2225.2	2226.7	5	14	5		
17	2695	MANI	1 S	0312	0312.5	1	5.4	2.7		
	8800	MANI	3 S	0312	0312.6	1	10.8	5.4		IG
	2695	MANI	1 S	0603.4	0603.5	.2	5.4	2.7		
	8800	MANI	1 S	0603.4	0603.6	.3	5.4	2.7		
	2695	SGMR	1 S	1340.8	1341.6	1.2	4.4	1.3		3G,CONT
	2800	OTTA	1 S	1341	1341.5	1	7.2	3		
	2800	OTTA	21 GRF	1500	1503	30	8.6	3		
	8800	SGMR	3 S	1502.5	1505	5.5	10.4	3.1		CONT
	2695	SGMR	3 S	1502.5	1505.2	5.5	20.8	6.2		CONT
	2800	OTTA	45 C	1503.5	1505	2.2	10.6	5.3		
18	2695	MANI	1 S	0046	0046.5	1.3	6	4.5		

SOLAR RADIO EMISSION
SELECTED FIXED FREQUENCY EVENTS

FEBRUARY 1978

FEB 1978	FREQUENCY	STATION	TYPE	STARTING TIME UT	TIME OF MAXIMUM UT	DURATION MINUTES	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1} PEAK	FLUX DENSITY MEAN	INT	REMARKS
	8800	MANI	1 S	0046	0046.5	.6	5.1	2.5		
	2695	MANI	3 S	0207.3	0207.7	2.7	24.3	16.2		
	8800	MANI	3 S	0207.6	0207.9	.9	25.5	17		I
	2800	OTTA	48 F	1358	1403	6	7.6			
	2800	OTTA	20 GRF	1604	1614	20	1.4	.7		
	2800	OTTA	20 GRF	1635	1647	15	1.4	.7		
	2800	OTTA	4 S/F	1731	1732.5	8	32.6	6.6		
	2695	SGMR	3 S	1731.2	1732.4	6.8	34.1	13.4		CONT
	2800	OTTA	1 S	1909	1909.3	1	1.8	.9		
	2800	OTTA	1 S	2150	2150.1	1.5	2.6	1.2		
20	2800	OTTA	20 GRF	1435	1445	15	1.6	.8		
	2800	OTTA	20 GRF	1525	1529	20	1.8	.9		
	2800	OTTA	1 S	1607	1608	4	3.4	1.5		
21	2695	PENT	20 GRF	2235	2255	60 D	5			
22	2800	OTTA	27A RF	1322		168	2	1.8		
	2800	OTTA	24 R	1322	1340	18	2	1		
	2800	OTTA	24P R	1340		127	2			
	2800	OTTA	22 GRF	1523	1527	22	1.8	.9		
	2800	OTTA	26 FAL	1547	1610	23	-2	-1		
23	2800	OTTA	27A RF	1315		190	2.6	2.2		
	2800	OTTA	24 R	1315	1328	13	2.6	1.3		
	2800	OTTA	1 S	1317	1318	3	2.6	1.3		
	2800	OTTA	24P R	1328		132	2.6			
	2800	OTTA	26 FAL	1540	1625	45	-2.6	-1.3		
	2695	PENT	1 S	2317.9	2318.2	1	2.8	1.4		
24	2695	MANI	3 S	0241.4	0242.1	2.6	16.3	9.7		
	8800	MANI	1 S	0241.6	0242.1	.9	8	4		
	2695	MANI	3 S	0735.6	0737	2.5	18	11.4		
	2800	OTTA	1 S	2003.2	2003.8	1	5.8	2.8		
	2695	SGMR	1 S	2003.3	2003.6	1	7.4	2.9		
	2695	BOUL	8 S	2004	2005	1.5	6	2		
	2695	PENT	1 S	2204.5	2205	1	1.6	.8		
	2695	BOUL	1 S	2205.5	2206	1.5	2	1		
25	2695	MANI	3 S	0305.8	0306.7	4.3	44.5	29.6		
	8800	MANI	3 S	0307.2	0308.7	2.4	151.2	100.8		
	8800	MANI	3 S	0314.5	0315.2	1.7	14.4	9.6		
	2695	MANI	3 S	0314.5	0315.7	1.8	30.8	20.5		
	2695	MANI	3 S	0808	0809.5	3.2	44.5	29.6		
	8800	MANI	3 S	0808.8	0809.4	2	144	95.9		
	2695	SGMR	3 S	1301.2	1304.3	6.9	10.5	3.2		
	2800	OTTA	4 S/F	1302	1304.5	6	10.4	3.5		
	8800	SGMR	1 S	1302.8	1304.1	5.1	8.4	2.5		
	2695	SGMR	3 S	1447.5	1450.8	16	187	56.1		SWF
	2800	OTTA	4 S/F	1448	1450.5	6	144	30.2		
	2800	OTTA	30 PBI	1454	1454	16	4.2	2.1		
	2695	BOUL	3 S	1448.5	1452	8.5	98	33		
	8800	SGMR	3 S	1448.9	1450.3	15.3	314	94.2		SWF
	2800	OTTA	48 F	1456	1457.5	7	21			
	2800	OTTA	1 S	1652.8	1653.3	3	2.8	1.5		
	2800	OTTA	24Q R	2105	2113	8	2	1		
	2695	PENT	1 S	2310.2	2310.8	1	.8	.4		
26	2695	MANI	3 S	0618.5	0618.8	3.3	16.2	10.8		
	8800	MANI	3 S	0618.5	0619	2	23.4	15.6		
	2695	MANI	3 S	0746.5	0746.7	1	11.8	7.8		
	2695	MANI	1 S	0749.7	0750.3	.9	1.5	.7		
	2695	SGMR	1 S	1410.4	1414.9	6.1	5.7	1.7		
	8800	SGMR	3 S	1411.9	1412	3.3	10.5	3.2		
	2800	OTTA	20 GRF	1555	1603	18	1.8	.9		
	2695	PENT	3 S	2325	2327.5	6	37.4	12.5		
	2695	PENT	29 PBI	2331	2331	22	4.8			
	2695	MANI	3 S	2325.7	2327.5	2.8	30.6	20.4		
	2695	BOUL	8 S	2326	2329	14	48	13		
	8800	MANI	1 S	2327	2327.5	1.3	9.5	6.4		
	2695	BOUL	3 S	2357.5	0004	11	42	14		
27	2695	PENT	4 S/F	0001.7	0002.7	4	13.6	6.8		
	2695	MANI	3 S	0001.8	0002.6	4	15.3	10.2		
	8800	MANI	3 S	0001.9	0002.6	1.3	23.8	15.9		
	2695	MANI	41 F	0559.9	0600.4	5.3	6.8	3.4		
	2800	OTTA	20 GRF	1245	1255	265	3	1.5		
	2800	OTTA	27F RF	1750		300	2.4	2.1		
	2800	OTTA	24 R	1750	1810	20	2.4	1.2		
	2800	OTTA	24P R	1810		230	2.4			
	2800	OTTA	26 FAL	2200	2250	50	-2.4	-1.2		
	2695	BOUL	3 S	2359	0003	14	12	4		
28	2800	OTTA	20 GRF	1250	1400	205	5	3		
	2800	OTTA	20 GRF	1914	1916	12	3.6	1.8		

Observatories:

BOUL = Boulder MANI = Manila OTTA = Ottawa ARO PENT = Penticton SGMR = Sagamore Hill

Explanation of Type Code:

1 Simple 1
2 Simple 1F
3 Simple 2
4 Simple 2F
5 Simple
6 Minor
7 Minor +
8 Spike
20 Simple 3
21 Simple 3A
22 Simple 3F
23 Simple 3AF
24 Rise
25 Rise A
26 Fall
27 Rise and Fall
28 Precursor
29 Post Burst Increase
30 Post Burst Increase A
31 Post Burst Decrease
32 Absorption
40 Fluctuation
41 Group of Bursts
42 Series of Bursts
43 Onset of Noise Storm
44 Noise Storm in Progress
45 Complex
46 Complex F
47 Great Burst
48 Major
49 Major +

SOLAR X-RAYS BY SATELLITE
SMS GOES
FEBRUARY 1978

.5 - 4Å Hourly Averages (10^{-5} watts/m^2)

MO DA	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Mean
2/ 1	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
2/ 2	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
2/ 3	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
2/ 4	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
2/ 5	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
2/ 6	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
2/ 7	.001	.002	.002	.002	.004	.005	.001	.001	.003	.004	.001	.001	B	B	B	.001	B	.006	.004	.002	B	.010	.002	.001	.002
2/ 8	.002	.002	.002	.017	.013	.005	.003	.015	.001	.038	.002	.013	.002	.002	.009	.003	.005	.002	.002	.003	.009	.004	.002	.002	.007
2/ 9	.013	.004	.003	.004	.009	.024	.003	.002	.003	.004	.002	.028	.003	.001	.027	.041	.152	B	.020	.003	.003	.009	.067	.052	.020
2/10	.066	.009	.022	.004	.009	.013	.003	.007	.012	.002	.098	.001	.001	B	.001	.001	.001	.040	.002	.002	.002	.108	.005	.002	.017
2/11	.003	.005	.001	.002	.001	.003	.003	.002	.006	.002	.001	.002	.002	.001	.010	.001	.002	.004	.003	.010	.009	.006	.002	.033	.005
2/12	.087	.004	.002	.004	.002	.001	.003	.003	.002	.004	.002	.047	.005	.006	.002	.003	.009	.002	.076	.155	.007	.002	.002	.002	.018
2/13	.005	.069	.553	.326	.152	.084	.053	.028	.025	.016	.010	.007	.005	.005	.011	.010	.008	.010	.009	.087	.004	.017	.003	.005	.062
2/14	.001	B	.001	.002	.001	.001	.002	.003	.001	.001	.001	.015	.003	.005	.007	.003	.003	.005	.002	.001	B	.003	.004	.014	.004
2/15	.006	.004	.003	.010	.035	.004	.003	.114	.036	.004	.016	.028	.003	.043	.008	.064	.099	.016	.013	.008	.005	.007	.022	.015	.023
2/16	.004	.003	.026	.013	.002	.002	.014	.001	.001	.002	.001	.002	.004	.002	.004	.004	.003	.002	.002	.005	.003	.012	.004	.001	.005
2/17	.035	.030	.027	.067	.002	.005	.003	.002	.001	.002	.001	.002	.002	.002	.017	.018	.060	.002	.023	.002	.006	.002	.003	.002	.013
2/18	.004	.002	.005	.002	.002	.002	.003	.003	.003	.004	.002	.003	.003	B	B	B	.001	.001	.003	.003	.002	.002	.016	B	.003
2/19	.001	.001	.008	.001	.002	.002	.002	.001	.001	.013	.002	.004	B	B	B	B	B	B	.001	.001	.006	.002	.024	B	.003
2/20	.001	B	B	B	B	.003	B	B	B	.001	B	B	B	B	B	B	.003	B	.002	.002	.001	.001	B	B	B
2/21	.005	B	B	B	.002	.002	.002	.037	.013	.002	B	.002	.001	B	B	.008	B	B	B	B	B	B	.004	.003	.004
2/22	B	B	.001	B	.013	B	B	.002	.001	B	B	.001	B	B	B	B	B	B	.002	B	.002	B	B	B	.001
2/23	B	B	.001	.002	.021	.027	.012	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	.003
2/24	.026	.009	.003	.001	.015	B	.006	B	B	B	B	B	B	B	B	B	B	B	B	B	.001	B	B	B	.003
2/25	B	B	.001	.094	B	B	B	B	.012	B	B	B	B	.002	.103	.009	B	B	B	.001	.001	.002	.001	.003	.010
2/26	.001	.002	.004	B	B	B	.009	.004	B	B	B	B	B	B	.005	B	B	B	B	B	.001	.003	B	.002	.002
2/27	.006	B	.001	.008	.009	.003	.002	.001	.002	.002	.002	.001	.002	B	B	B	B	B	.003	.002	.001	.001	B	B	.002
2/28	B	.001	B	B	B	.002	.001	.007	.003	.001	B	B	B	B	B	M	B	B	.001	.001	B	B	B	B	.001

Note: "B" indicates the flux was below the cut-off levels.
"M" denotes periods of missing data.

SOLAR X-RAYS BY SATELLITE
SMS GOES
FEBRUARY 1978

1 - 8Å Hourly Averages (10^{-4} watts/m^2)

MO	DA	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Mean
2/	1	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
2/	2	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
2/	3	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
2/	4	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
2/	5	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
2/	6	M	M	M	M	M	M	M	M	M	M	M	M	M	.009	.009	.010	.008	.018	.010	.012	.010	.022	.011	.010	.009
2/	7	.010	.012	.013	.014	.016	.021	.013	.011	.016	.059	.011	.010	.009	.009	.009	.010	.008	.018	.010	.012	.010	.022	.011	.010	.009
2/	8	.012	.015	.014	.022	.031	.020	.020	.034	.013	.013	.013	.030	.018	.015	.027	.017	.019	.015	.013	.012	.026	.022	.018	.015	.013
2/	9	.032	.023	.015	.018	.023	.049	.018	.011	.015	.013	.012	.043	.019	.014	.045	.058	.107	.016	.035	.018	.015	.023	.066	.077	.026
2/	10	.066	.023	.036	.013	.023	.028	.011	.021	.013	.010	.012	.009	.008	.007	.010	.010	.010	.055	.011	.010	.010	.120	.024	.017	.020
2/	11	.020	.025	.012	.010	.008	.012	.016	.012	.018	.014	.011	.012	.011	.010	.019	.009	.010	.014	.013	.024	.032	.022	.013	.030	.016
2/	12	.084	.022	.012	.014	.010	.009	.012	.013	.011	.015	.011	.051	.020	.019	.014	.016	.028	.012	.061	.121	.027	.017	.015	.010	.022
2/	13	.015	.058	.379	.361	.199	.129	.099	.072	.067	.056	.040	.031	.026	.024	.032	.023	.028	.026	.025	.084	.022	.018	.014	.015	.070
2/	14	.011	.009	.010	.011	.010	.009	.013	.012	.011	.011	.012	.026	.018	.015	.014	.013	.014	.020	.015	.011	.013	.014	.019	.030	.009
2/	15	.021	.016	.013	.023	.045	.019	.016	.068	.047	.015	.013	.014	.013	.035	.022	.019	.020	.016	.022	.023	.015	.014	.032	.025	.023
2/	16	.017	.014	.011	.010	.011	.011	.026	.010	.011	.011	.010	.010	.017	.012	.021	.013	.011	.009	.012	.018	.015	.023	.016	.010	.016
2/	17	.020	.032	.023	.036	.010	.015	.012	.012	.013	.010	.008	.009	.009	.010	.010	.014	.022	.010	.015	.010	.011	.009	.010	.010	.013
2/	18	.013	.011	.015	.011	.011	.011	.015	.024	.013	.014	.011	.012	.011	.010	.009	.009	.011	.010	.013	.011	.012	.010	.022	.009	.009
2/	19	.010	.010	.029	.011	.011	.012	.011	.010	.011	.010	.011	.015	.009	.008	.008	.008	.008	.008	.008	.008	.009	.007	.006	.007	.008
2/	20	.010	.006	.007	.006	.006	.006	.007	.006	.010	.006	.007	.006	.006	.005	.006	.006	.012	.007	.007	.008	.007	.007	.007	.006	.004
2/	21	.006	.005	.005	.006	.007	.010	.016	.008	.009	.010	.006	.009	.008	.007	.006	.016	.009	.006	.007	.008	.006	.006	.011	.013	.006
2/	22	.008	.006	.008	.006	.008	.007	.007	.008	.008	.007	.006	.008	.007	.006	.006	.006	.006	.006	.009	.006	.130	.006	.006	.005	.007
2/	23	.007	.005	.007	.008	.007	.008	.006	.006	.006	.006	.006	.006	.006	.006	.005	.005	.005	.005	.005	.005	.006	.006	.006	.007	.004
2/	24	.030	.021	.010	.008	.008	.006	.008	.006	.005	.006	.005	.005	.006	.005	.005	.005	.005	.005	.005	.005	.006	.006	.005	.005	.005
2/	25	.005	.007	.009	.057	.006	.006	.005	.006	.016	.006	.007	.005	.006	.010	.059	.019	.008	.007	.006	.008	.008	.010	.008	.013	.011
2/	26	.008	.010	.010	.007	.007	.006	.017	.008	.007	.006	.007	.006	.006	.005	.010	.006	.008	.007	.007	.006	.007	.010	.006	.008	.005
2/	27	.013	.007	.009	.025	.034	.016	.019	.016	.014	.014	.013	.011	.012	.009	.007	.008	.009	.008	.013	.016	.011	.010	.008	.006	.008
2/	28	.007	.009	.007	.006	.008	.009	.012	.025	.019	.012	.010	.008	.007	.007	.007	M	.007	.008	.008	.008	.007	.006	.007	.006	.005

Note: "B" indicates the flux was below the cut-off levels.
"M" denotes periods of missing data.

SOLAR X-RAYS BY SATELLITE

GOES

FEBRUARY 1978

DAY	BEGIN TIME	.5-4A Wm^{-2}	1-8A Wm^{-2}	MAX TIME	.5-4A Wm^{-2}	1-8A Wm^{-2}	1/2P TIME	.5-4A Wm^{-2}	1-8A Wm^{-2}
1	0051		6.5E-07	0059		1.7E-06	0118		1.1E-06
1	0131		1.1E-06	0152		6.5E-06	0203		3.5E-06
1	0559		1.2E-06	0602		1.7E-06	0604		1.2E-06
1	1513		7.6E-07	1520		1.3E-06	1525		1.0E-06
1	1823		8.9E-07	1829		1.4E-06	1903		1.1E-06
1	2247		1.1E-06	2250		1.6E-06	2253		1.3E-06
1	2350		1.7E-06	0001		4.1E-06	0009		2.9E-06
2	0128		1.7E-06	0131		2.5E-06	0136		2.0E-06
2	0421		1.2E-06	0450		3.0E-06	0506		2.1E-06
2	1133		1.4E-06	1139		1.8E-05	1144		8.8E-06
3	0053		1.3E-06	0056		2.0E-06	0106		1.6E-06
3	0254		4.9E-06	0258		9.4E-06	0300		6.9E-06
3	0441		1.7E-06	0449		1.0E-05	0456		5.8E-06
3	0746		1.1E-06	0750		2.2E-06	0752		1.6E-06
3	0746		1.1E-06	0750		2.2E-06	0752		1.6E-06
3	0759		1.3E-06	0812		9.3E-06	0825		5.2E-06
3	2335		1.1E-06	2338		1.8E-06	2340		1.3E-06
4	0014		8.7E-07	0017		1.4E-06	0024		1.1E-06
4	1852		9.9E-07	1855		1.9E-06	1900		1.4E-06
5	0123		1.0E-06	0128		2.2E-06	0135		1.6E-06
5	0219		1.2E-06	0222		1.8E-06	0224		1.3E-06
5	0245		1.1E-06	0248		2.0E-06	0252		1.4E-06
5	0657		8.8E-07	0700		1.8E-06	0709		1.3E-06
6	0816		1.3E-06	0823		2.0E-06	0827		1.6E-06
6	2143		1.1E-06	2146		1.7E-06	2151		1.4E-06
7	1533		9.8E-07	1536		1.8E-06	1538		1.3E-06
7	1712		1.1E-06	1721		3.4E-06	1732		2.2E-06
7	2109		9.7E-07	2116		6.5E-06	2125		3.6E-06
8	0019		1.0E-06	0022		1.9E-06	0025		1.4E-06
8	0351		1.2E-06	0357		1.7E-05	0400		9.1E-06
8	0545		1.4E-06	0552		3.8E-06	0612		2.5E-06
8	0709		1.4E-06	0716		8.5E-06	0727		4.8E-06
8	1111		1.4E-06	1131		4.7E-06	1148		3.0E-06
8	1420		1.7E-06	1435		4.4E-06	1449		3.0E-06
8	1628		1.3E-06	1639		4.1E-06	1642		2.5E-06
8	1954	2.2E-08	1.2E-06	2006	2.7E-07	4.2E-06	2013	9.6E-08	2.7E-06
9	0025	6.8E-08	2.3E-06	0035	3.3E-07	5.4E-06	0048	1.3E-07	3.9E-06
9	0254	1.6E-08	1.5E-06	0258	1.1E-07	2.5E-06	0300	3.2E-08	1.8E-06
9	0338	4.2E-08	1.7E-06	0344	1.8E-07	3.5E-06	0349	6.9E-08	2.6E-06
9	0804	2.6E-08	1.4E-06	0810	1.0E-07	2.6E-06	0817	4.3E-08	2.0E-06
9	0947	1.3E-08	1.0E-06	0955	1.8E-07	2.8E-06	1001	4.7E-08	1.9E-06
9	1109	7.7E-09	9.2E-07	1122	6.9E-07	7.8E-06	1133	1.3E-07	4.3E-06
9	1154	1.2E-07	3.7E-06	1159	1.5E-06	1.2E-05	1201	1.7E-07	4.3E-06
9	1357	1.5E-08	1.2E-06	1406	3.4E-07	4.4E-06	1427	8.4E-08	2.8E-06
9	1443	1.0E-07	3.1E-06	1454	8.0E-07	9.5E-06	1507	2.6E-07	6.2E-06
9	1518	1.9E-07	4.9E-06	1526	1.0E-06	8.6E-06	1533	6.1E-07	6.7E-06
9	1559	1.2E-07	3.7E-06	1605	1.0E-05	6.2E-05	1609	3.5E-06	3.0E-05
9	1823	1.8E-08	1.6E-06	1834	7.9E-07	7.8E-06	1847	1.4E-07	4.5E-06
9	1926	1.5E-08	1.3E-06	1932	1.1E-07	2.5E-06	1938	3.2E-08	1.9E-06
9	2102	2.5E-08	1.3E-06	2110	3.6E-07	4.5E-06	2121	8.3E-08	2.8E-06
9	2156	4.3E-08	1.9E-06	2256	3.1E-06	1.9E-05	2310	6.9E-07	1.0E-05

SOLAR X-RAYS BY SATELLITE

GOES

FEBRUARY 1978

DAY	BEGIN TIME	.5-4A Wm^{-2}	1-8A Wm^{-2}	MAX TIME	.5-4A Wm^{-2}	1-8A Wm^{-2}	1/2P TIME	.5-4A Wm^{-2}	1-8A Wm^{-2}
9	2326	2.7E-07	6.1E-06	2331	1.1E-06	1.0E-05	2335	5.6E-07	8.0E-06
10	0017	2.2E-07	4.0E-06	0023	2.8E-06	1.9E-05	0032	1.3E-06	1.1E-05
10	0656	3.1E-08	1.3E-06	0700	7.8E-07	6.6E-06	0702	2.0E-07	3.7E-06
10	1158	8.6E-09	8.0E-07	1203	6.2E-08	1.6E-06	1207	2.6E-08	1.1E-06
10	1711	7.1E-08	2.0E-06	1733	1.1E-06	1.1E-05	1743	2.0E-07	6.5E-06
10	1816	1.0E-08	9.3E-07	1819	4.4E-08	1.3E-06	1824	1.8E-08	1.1E-06
10	1908	2.1E-08	1.1E-06	1911	3.6E-08	1.9E-06	1913	3.3E-08	1.3E-06
10	2100	2.7E-08	1.3E-06	2103	3.3E-08	1.8E-06	2105	3.5E-08	1.4E-06
10	2105	3.5E-08	1.4E-06	2117	4.5E-06	3.6E-05	2128	1.3E-06	1.8E-05
11	0318	8.0E-09	8.5E-07	0323	8.0E-08	1.8E-06	0327	2.6E-08	1.3E-06
11	0346	1.3E-08	9.3E-07	0350	3.6E-08	1.4E-06	0355	1.8E-08	1.1E-06
11	0507	2.4E-08	1.1E-06	0518	6.2E-08	1.9E-06	0526	2.1E-08	1.5E-06
11	0608	2.0E-08	1.1E-06	0619	6.5E-08	2.2E-06	0629	1.6E-08	1.6E-06
11	0754	4.3E-08	1.6E-06	0757	9.1E-08	2.2E-06	0759	5.3E-08	1.8E-06
11	0814	3.7E-08	1.3E-06	0820	2.9E-07	3.9E-06	0825	7.7E-08	2.4E-06
11	1112	2.0E-08	1.2E-06	1115	2.9E-08	1.8E-06	1118	2.8E-08	1.4E-06
11	1131	2.2E-08	1.1E-06	1135	9.7E-08	2.1E-06	1138	2.4E-08	1.6E-06
11	1250	2.0E-08	1.1E-06	1253	4.8E-08	1.9E-06	1255	3.5E-08	1.4E-06
11	1346	1.0E-08	8.1E-07	1350	4.1E-08	1.3E-06	1353	1.4E-08	1.0E-06
11	1416	2.0E-08	1.2E-06	1419	3.4E-08	1.7E-06	1422	3.3E-08	1.4E-06
11	1424	2.9E-08	1.3E-06	1429	1.0E-06	7.9E-06	1434	1.5E-07	3.9E-06
11	1659	1.3E-08	9.7E-07	1704	1.7E-07	3.0E-06	1711	4.8E-08	1.9E-06
11	1831	4.6E-08	1.5E-06	1839	1.0E-07	2.4E-06	1844	3.6E-08	1.8E-06
11	2116	4.1E-08	1.9E-06	2121	1.1E-07	2.9E-06	2126	6.0E-08	2.3E-06
11	2348	7.0E-07	5.4E-06	0012	2.1E-06	1.7E-05	0019	1.2E-06	1.1E-05
12	0312	1.8E-08	1.0E-06	0317	2.1E-07	3.3E-06	0322	5.8E-08	2.1E-06
12	0420	2.9E-08	1.2E-06	0423	4.3E-08	2.0E-06	0425	3.8E-08	1.3E-06
12	0607	1.5E-08	8.4E-07	0616	4.1E-08	1.7E-06	0621	2.5E-08	1.2E-06
12	0939	2.1E-08	1.2E-06	0943	2.0E-07	3.3E-06	0947	5.5E-08	2.1E-06
12	1059	2.8E-08	1.2E-06	1135	8.3E-07	7.3E-06	1149	2.1E-07	4.2E-06
12	1306	2.1E-08	1.4E-06	1311	2.3E-07	3.9E-06	1320	8.6E-08	2.5E-06
12	1845	1.8E-08	1.5E-06	1907	2.5E-06	1.7E-05	1946	6.6E-07	9.3E-06
13	0148	1.7E-06	1.1E-05	0255	8.0E-06	6.2E-05	0327	3.2E-06	3.6E-05
13	1036	9.9E-08	3.8E-06	1039	3.2E-07	5.7E-06	1041	1.1E-07	4.7E-06
13	1451	8.1E-08	2.8E-06	1454	1.9E-07	9.7E-06	1456	8.2E-08	2.9E-06
13	1548	1.5E-08	1.8E-06	1553	2.3E-06	4.3E-06	1555	5.1E-08	2.3E-06
13	1727	5.3E-08	2.3E-06	1731	3.2E-07	4.5E-06	1734	1.8E-07	3.4E-06
13	1821	6.3E-08	2.2E-06	1824	1.9E-07	3.4E-06	1832	1.1E-07	2.7E-06
13	1858	1.6E-07	3.1E-06	1913	2.0E-06	1.4E-05	1930	5.9E-07	8.5E-06
13	2136	1.6E-08	1.2E-06	2140	3.7E-07	4.2E-06	2144	6.4E-08	2.3E-06
13	2208	2.4E-08	1.4E-06	2212	2.5E-07	3.6E-06	2215	2.8E-08	1.9E-06
13	2321	1.8E-08	9.7E-07	2326	2.7E-07	3.5E-06	2335	7.1E-08	2.1E-06
14	0357	1.6E-08	1.2E-06	0400	2.9E-08	1.7E-06	0403	2.1E-08	1.1E-06
14	0618	3.1E-08	1.5E-06	0621	1.3E-07	2.3E-06	0623	2.7E-08	1.6E-06
14	0657	1.1E-08	1.0E-06	0705	3.4E-07	4.2E-06	0707	7.2E-08	2.4E-06
14	0804	2.8E-08	1.1E-06	0807	3.8E-08	1.7E-06	0809	2.9E-08	1.3E-06
14	0848	1.3E-08	1.1E-06	0851	2.3E-08	1.6E-06	0854	2.6E-08	1.2E-06
14	0858	1.8E-08	1.2E-06	0901	5.2E-08	1.8E-06	0903	2.3E-08	1.5E-06
14	1110	8.9E-08	1.9E-06	1126	3.7E-07	4.5E-06	1133	1.4E-07	3.1E-06
14	2006	9.0E-09	1.1E-06	2009	8.7E-09	2.0E-06	2011	7.9E-09	1.2E-06
14	2125	1.2E-08	1.1E-06	2128	2.2E-08	1.8E-06	2131	1.8E-08	1.4E-06

SOLAR X-RAYS BY SATELLITE

GOES

FEBRUARY 1978

DAY	BEGIN TIME	.5-4A Wm^{-2}	1-8A Wm^{-2}	MAX TIME	.5-4A Wm^{-2}	1-8A Wm^{-2}	1/2P TIME	.5-4A Wm^{-2}	1-8A Wm^{-2}
14	2312	4.2E-08	1.8E-06	2322	5.2E-07	6.4E-06	2331	1.6E-07	3.9E-06
15	0100	2.6E-08	1.6E-06	0105	1.3E-07	3.1E-06	0112	5.3E-08	2.3E-06
15	0254	2.6E-08	1.2E-06	0329	1.9E-07	3.4E-06	0339	5.7E-08	2.2E-06
15	0358	4.0E-08	1.5E-06	0407	6.3E-07	7.1E-06	0415	1.5E-07	4.0E-06
15	0439	2.8E-07	3.7E-06	0446	1.0E-06	8.4E-06	0451	4.3E-07	5.9E-06
15	0715	3.6E-08	1.8E-06	0727	6.0E-07	7.1E-06	0732	1.6E-07	4.2E-06
15	0745	1.4E-07	3.0E-06	0754	6.1E-06	2.6E-05	0803	1.8E-06	1.3E-05
15	0903	3.1E-08	1.4E-06	0907	1.1E-07	2.2E-06	0910	3.0E-08	1.7E-06
15	0912	3.2E-08	1.6E-06	0915	1.0E-07	2.2E-06	0918	3.2E-08	1.7E-06
15	0955	1.2E-08	1.0E-06	0958	1.6E-07	1.7E-06	1000	1.0E-08	1.0E-06
15	1006	2.3E-08	1.3E-06	1011	1.5E-07	2.8E-06	1016	2.8E-08	1.9E-06
15	1148	1.1E-08	1.0E-06	1151	4.0E-06	2.6E-06	1153	1.1E-08	1.0E-06
15	1331	5.2E-08	1.4E-06	1351	2.6E-06	1.3E-05	1400	5.6E-07	7.0E-06
15	1837	1.3E-06	1.2E-06	1841	1.1E-06	5.2E-06	1843	5.8E-08	2.3E-06
15	2011	5.3E-08	1.4E-06	2021	7.9E-08	3.5E-06	2023	8.1E-08	2.2E-06
15	2039	3.1E-08	9.2E-07	2043	5.9E-08	1.5E-06	2047	2.5E-08	1.1E-06
15	2111	1.6E-08	1.0E-06	2115	6.2E-08	1.8E-06	2117	2.7E-08	1.2E-06
15	2151	1.9E-08	1.0E-06	2157	5.4E-07	4.3E-06	2205	1.3E-07	2.7E-06
15	2225	2.5E-08	1.6E-06	2239	1.1E-06	9.2E-06	2244	1.7E-07	4.9E-06
15	2327	2.8E-08	1.3E-06	2333	1.0E-06	6.7E-06	2343	1.8E-07	3.9E-06
16	0014	2.3E-08	1.6E-06	0018	2.4E-07	3.8E-06	0021	7.3E-08	2.4E-06
16	0139	4.1E-08	1.3E-06	0143	1.0E-07	2.1E-06	0146	3.2E-08	1.7E-06
16	0435	1.8E-08	1.1E-06	0438	1.2E-07	2.2E-06	0440	4.5E-08	1.5E-06
16	0606	1.7E-08	1.1E-06	0614	8.3E-07	7.0E-06	0620	1.3E-07	3.9E-06
16	0629	3.8E-08	1.8E-06	0639	3.2E-07	4.0E-06	0644	6.4E-08	2.6E-06
16	0924	1.0E-08	9.2E-07	0929	7.3E-08	1.8E-06	0931	3.7E-08	1.3E-06
16	1228	1.4E-08	1.0E-06	1233	1.6E-07	3.1E-06	1238	1.9E-08	1.7E-06
17	0056	4.2E-08	1.2E-06	0108	7.3E-08	1.7E-06	0117	4.6E-08	1.4E-06
17	0136	2.5E-08	1.1E-06	0144	3.6E-06	1.7E-05	0148	5.0E-07	8.0E-06
17	0303	2.8E-08	1.2E-06	0306	4.9E-08	1.9E-06	0308	4.4E-08	1.6E-06
17	0309	4.3E-08	1.6E-06	0315	3.1E-06	1.9E-05	0317	8.8E-07	7.5E-06
17	0748	1.0E-08	9.0E-07	0751	5.9E-08	1.4E-06	0755	1.6E-08	1.1E-06
17	0921	2.4E-08	1.1E-06	0924	5.3E-08	2.1E-06	0926	5.5E-08	1.6E-06
17	1246	5.6E-09	7.6E-07	1250	2.0E-07	2.6E-06	1252	6.0E-08	1.4E-06
17	1338	9.2E-10	7.6E-07	1342	1.4E-07	2.4E-06	1345	2.6E-08	1.2E-06
17	1435	4.9E-10	7.2E-07	1438	7.3E-06	6.2E-06	1442	6.5E-10	8.1E-07
17	1459	4.1E-09	8.8E-07	1509	1.4E-07	2.6E-06	1515	2.3E-08	1.7E-06
17	1551	3.1E-08	1.2E-06	1601	1.5E-05	2.8E-06	1603	3.5E-08	1.4E-06
17	1613	3.5E-08	1.3E-06	1616	4.8E-08	2.1E-06	1618	2.9E-08	1.3E-06
17	2210	3.2E-08	1.1E-06	2213	7.3E-08	1.9E-06	2216	5.2E-08	1.3E-06
17	2217	4.2E-08	1.2E-06	2220	1.4E-07	1.9E-06	2224	4.7E-08	1.4E-06
17	2302	1.0E-08	8.3E-07	2306	6.9E-08	1.3E-06	2309	1.9E-08	9.6E-07
18	0045	3.9E-08	1.4E-06	0048	2.3E-07	3.0E-06	0050	8.4E-08	2.1E-06
18	0206	1.9E-08	1.2E-06	0209	5.1E-07	5.2E-06	0212	3.5E-08	2.0E-06
18	2158	1.6E-08	1.0E-06	2208	1.0E-06	7.5E-06	2214	1.6E-07	4.1E-06
19	1044	8.1E-09	9.5E-07	1049	1.0E-07	2.1E-06	1058	3.0E-08	1.4E-06
19	1109	3.1E-08	1.2E-06	1115	1.4E-07	2.5E-06	1121	4.5E-08	1.8E-06
19	1147	1.4E-08	9.9E-07	1150	6.3E-08	2.0E-06	1153	3.5E-08	1.4E-06
20	0005	6.1E-09	7.3E-07	0009	1.0E-07	1.8E-06	0013	3.1E-08	1.2E-06
20	1045	1.0E-08	7.8E-07	1048	3.2E-08	1.1E-06	1054	9.5E-09	8.5E-07
20	1526	5.7E-09	6.1E-07	1530	2.3E-08	9.5E-07	1537	5.9E-09	7.8E-07

SOLAR X-RAYS BY SATELLITE

GOES

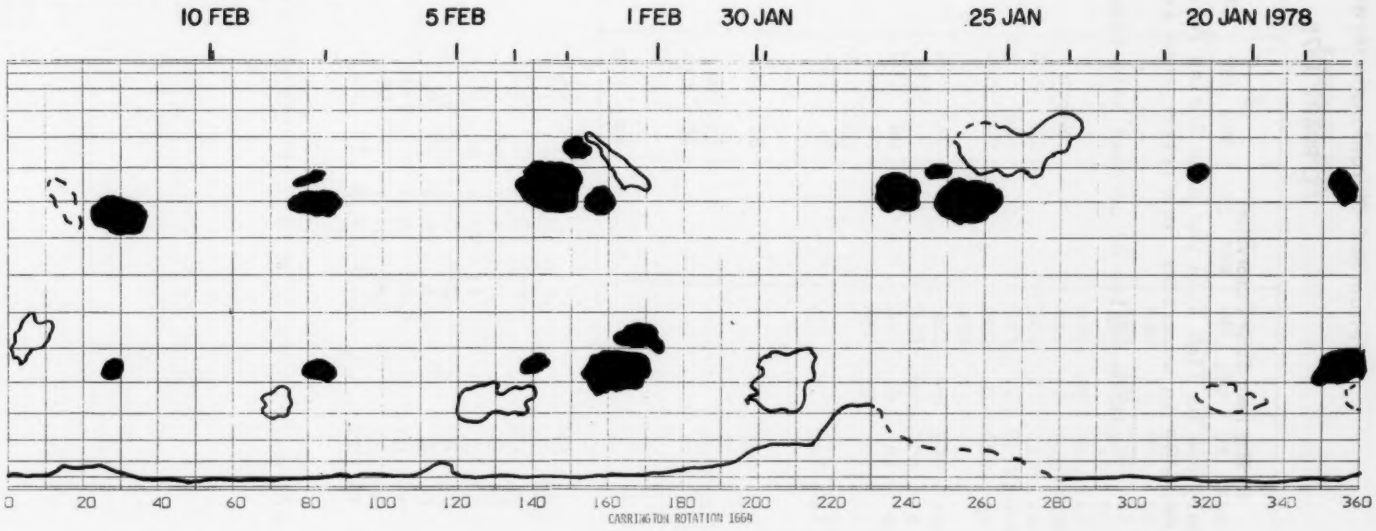
FEBRUARY 1978

DAY	BEGIN TIME	.5-4A Wm^{-2}	1-8A Wm^{-2}	MAX TIME	.5-4A Wm^{-2}	1-8A Wm^{-2}	1/2P TIME	.5-4A Wm^{-2}	1-8A Wm^{-2}
20	1605	1.0E-08	7.8E-07	1612	1.6E-07	3.0E-06	1619	3.3E-08	1.8E-06
20	1842	1.2E-08	7.1E-07	1845	3.9E-08	1.0E-06	1849	2.5E-08	8.6E-07
20	2136	1.4E-08	7.1E-07	2139	3.9E-08	1.0E-06	2142	1.5E-08	8.3E-07
21	0842	6.1E-09	6.4E-07	0850	9.6E-08	1.9E-06	0856	4.4E-08	1.2E-06
21	1133	1.1E-08	7.5E-07	1137	9.9E-08	1.8E-06	1145	4.5E-08	1.2E-06
21	1514	2.5E-08	8.9E-07	1521	3.7E-07	3.6E-06	1530	1.1E-07	2.2E-06
21	2220	1.0E-08	6.3E-07	2226	1.2E-07	1.8E-06	2239	4.1E-08	1.2E-06
22	0910	1.2E-08	7.3E-07	0913	4.0E-08	1.0E-06	0916	1.7E-08	7.6E-07
22	1121	9.5E-09	6.8E-07	1126	6.1E-08	1.4E-06	1134	2.1E-08	9.8E-07
22	1829	1.3E-08	6.8E-07	1839	1.3E-07	2.3E-06	1842	4.6E-08	1.3E-06
23	0311	4.7E-09	5.4E-07	0315	9.8E-08	1.9E-06	0323	2.4E-08	1.1E-06
23	1316	9.0E-09	6.9E-07	1320	2.7E-08	1.1E-06	1323	1.2E-08	9.0E-07
24	0240	8.9E-09	7.1E-07	0243	3.6E-07	4.2E-06	0245	3.9E-08	1.3E-06
24	0733	3.1E-09	5.4E-07	0737	5.2E-08	1.4E-06	0739	1.0E-08	7.3E-07
24	2049	3.4E-09	4.8E-07	2054	4.6E-08	1.0E-06	2059	1.2E-08	6.8E-07
25	0805	1.0E-08	6.8E-07	0812	1.1E-06	7.8E-06	0817	1.6E-07	3.7E-06
25	1300	1.3E-08	7.0E-07	1308	5.8E-08	1.3E-06	1314	2.8E-08	9.6E-07
25	1417	1.2E-08	8.1E-07	1422	4.8E-08	1.4E-06	1425	2.0E-08	1.0E-06
25	1445	6.4E-09	6.9E-07	1453	9.6E-06	4.1E-05	1459	2.1E-06	1.9E-05
25	1915	6.4E-09	6.2E-07	1919	4.3E-08	1.2E-06	1921	1.4E-08	8.2E-07
26	0023	1.0E-08	7.3E-07	0026	3.4E-08	1.0E-06	0028	1.3E-08	8.6E-07
26	0108	2.0E-08	1.0E-06	0115	9.7E-08	2.2E-06	0117	3.9E-08	1.5E-06
26	0227	1.3E-08	8.5E-07	0230	4.7E-07	4.3E-06	0232	1.1E-07	2.5E-06
26	0616	4.7E-09	6.7E-07	0619	1.1E-06	7.0E-06	0623	1.7E-07	3.3E-06
26	1409	2.9E-09	5.4E-07	1414	1.0E-06	6.9E-06	1416	1.7E-07	3.4E-06
26	2006	8.6E-09	5.9E-07	2012	3.3E-08	1.0E-06	2015	1.7E-08	7.6E-07
26	2057	1.5E-08	7.5E-07	2100	3.5E-08	1.6E-06	2105	4.1E-08	1.1E-06
26	2324	6.5E-09	5.7E-07	2332	6.7E-08	2.1E-06	2337	3.7E-08	1.3E-06
26	2359	6.9E-09	6.6E-07	0003	1.0E-06	7.7E-06	0006	1.4E-07	3.3E-06
28	0711	2.6E-08	1.4E-06	0741	1.7E-07	4.4E-06	0758	7.1E-08	2.8E-06

HELIUM 10830Å SYNOPTIC MAPS

CARRINGTON ROTATION 1664

KITT PEAK NATIONAL OBSERVATORY



35
Feb 78

CORONAL HOLES

Helium D3 Chromosphere at Solar Limb

FEBRUARY 1978

Big Bear Solar Observatory

Only one D3 limb scan was made during February. These data are presented in numerical form rather than graphically.

Position angles of coronal hole boundaries (in degrees)

Date	North		South	
February 19	+24°	-6°	-171°	+159°

SOLAR WIND

Interplanetary Scintillations

FEBRUARY 1978

DAY	3C48 VEL	3C48 ERR	3C144 VEL	3C144 ERR	3C147 VEL	3C147 ERR	3C161 VEL	3C161 ERR	3C237 VEL	3C237 ERR	3C273 VEL	3C273 ERR	3C298 VEL	3C298 ERR	3C459 VEL	3C459 ERR
1	333	14											436	40	330	39
2	328	50									432	71	346	54		
3	334	23	321	5							429	88	399	19	369	29
4	411	5	339	29									319	53	323	54
5	313	35									439	33	546	65	287	32
6	367	27									442	13	320	24	428	59
7	335	4					394	32			384	19	317	69	363	7
8	359	13	330	10							344	6			326	45
9	392	22	320	5			419	109			382	3	367	24	433	14
10	454	62	369	5	327	6					339	21				
11	259	24	330	6	357	9	277	10			383	48	248	70		
12	278	11	346	28			425	9			535	22	384	16		
13	284	4	259	3			273	30			360	5	361	5		
14			270	7			352	10			275	3				
18	305	5	256	11			270	26								
19			271	38			432	9					415	17		
20	428	6	338	9												
21			366	17												
23	385	7	203	5			332	38					369	18		
23	434	41														
24	448	7	374	52			335	10					305	41		
25			396	7			312	36								
26	385	13														
27	436	15	475	12												
28	344	20	330	7			811	199								

FEBRUARY	5				15				25			
	UT	LAT	DIST	DLON	UT	LAT	DIST	DLON	UT	LAT	DIST	DLON
3C48	1.	1.	0.99	-16.	24.	2.	0.94	-19.	23.	6.	0.87	-27.
3C144	4.	-5.	1.20	-12.	4.	-6.	1.17	-13.	3.	-7.	1.12	-15.
3C147	4.	0.	1.20	-10.	3.	0.	1.16	-11.	2.	0.	1.13	-13.
3C161	6.	-12.	1.22	-8.	5.	-13.	1.20	-10.	5.	-14.	1.16	-12.
3C237	9.	-7.	1.29	3.	9.	-7.	1.30	1.	8.	-7.	1.30	-1.
3C273	11.	-5.	1.22	11.	11.	-5.	1.25	9.	10.	-6.	1.27	7.
3C298	13.	-1.	1.12	14.	13.	-2.	1.16	13.	12.	-2.	1.20	11.
3C459	22.	10.	0.58	-52.	21.	15.	0.43	-61.	21.	27.	0.28	-68.

Note: 3C48 observed at 0 hr UT before February 19, at 23 hr UT after February 19.

INFERRED IP MAGNETIC FIELD

BARTELS ROTATION	DATE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1956	AUG 16							TA T*								*		AT			-	AT -	AT -	AT -	TA -	-	-	-
1957	SEP 12	-	-	AT -	-	-	-	-	-	-	-	AT -	-	AT -	AT -	-	AT -	-	-	-	-			AT		-		
1958	OCT 9	AT *	A*		A*		*				TA	A*			*	-	-	-	*		TA	AT	AT	-			AT	
1959	NOV 5	AT	TA			TA		T*		*	AT *		-		*	-											*	
1960	DEC 2							TA		*						AT		*					- *			-	TA -	
1961	DEC 29	-	AT -	*	*	*			AT				*			*	A*		*	*			*					AT
1962	1977 JAN 25			-			-	-	TA -		A*			AT -			*	-			*	-				TA		
1963	FEB 21	AT	-	-	-	-	TA		TA			*									-			-				
1964	MAR 20		TA		AT					*			-	-						A*				-				
1965	APR 16			TA		TA -	AT	TA		TA		AT				-	-	TA		AT	AT			TA			AT
1966	MAY 13	TA	-	-		TA			TA											AT	- -	AT T*	- T*				AT AT	-
1967	JUN 9								TA		-			TA						AT	A*				AT *	A*		TA TA
1968	JUL 6										A*			T*	TA	TA		T*			AT			-	AT		-	
1969	AUG 2		TA						TA	-			TA	*								AT	TA					
1970	AUG 29			-	-	-		TA										AT	AT			AT	TA	TA -	AT	AT		
1971	SEP 25						-	-	-	-	-	-					TA				TA							
1972	OCT 22					-	AT														AT AT					*		
1973	NOV 18			TA	AT						-		AT							*			*		*			
1974	DEC 15				-	-	-		AT -		AT				AT	AT		AT		TA		TA		TA			*	
1975	1978 JAN 11		*	*					*		*	*						*			TA	-	AT			-		-
1976	FEB 7						*	TA				-			-						-		*					

▩ = definitely towards the sun □ = definitely away from the sun

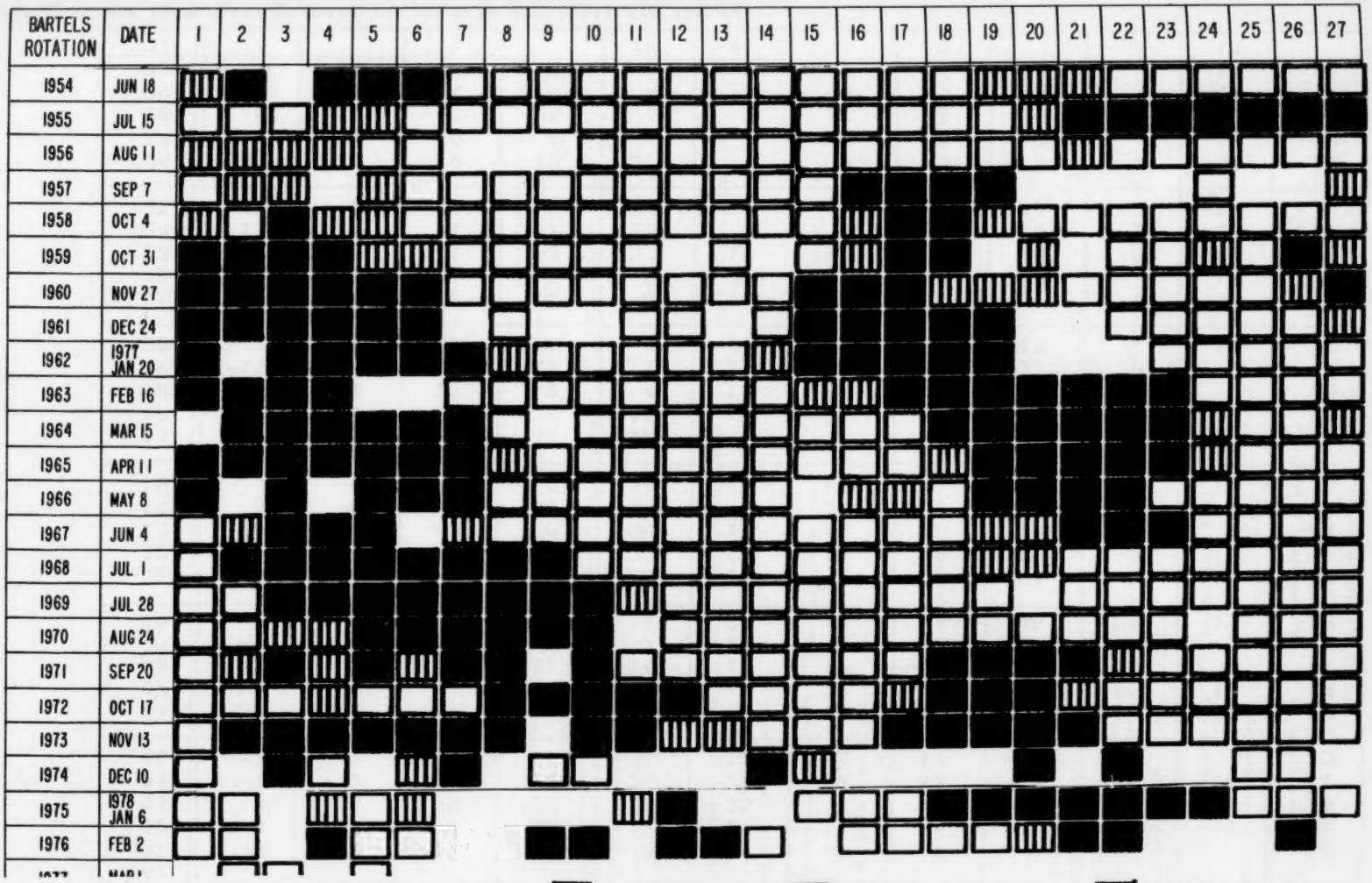
T = towards the sun A = away from the sun * = effect doubtful or not discernible - = missing data

The table shows daily inferences of the polarity of the interplanetary magnetic field. The first half of the day is based principally on magnetograms produced by the magnetometer at the Vostok Antarctic Station of the USSR. The magnetometer of the U.S. Air Weather Service now operated at Thule by the Danish Meteorological Institute is used for the second half of the day.
Note: The Bartels Rotation numbers after Rotation number 1955 were incorrect in this Table in SGD issues 385 Part I through 389 Part I.
Errata: Thule data for December 5, 6, 10, 11, 12 and 19, 1976 have been corrected.

STANFORD MEAN SOLAR MAGNETIC FIELD

The table shows daily inferences of the polarity of the interplanetary magnetic field. The first half of the day is based principally on magnetograms produced by the magnetometer at the Vostok Antarctic Station of the USSR. The magnetometer of the U.S. Air Weather Service now operated at Thule by the Danish Meteorological Institute is used for the second half of the day.
Note: The Bartels Rotation numbers after Rotation number 1955 were incorrect in this Table in SGD issues 385 Part I through 389 Part I.
Errata: Thule data for December 5, 6, 10, 11, 12 and 19, 1976 have been corrected.

STANFORD MEAN SOLAR MAGNETIC FIELD



POLARITY OF THE MEAN SOLAR MAGNETIC FIELD: □ = FIELD >2μT, ▥ = -2μT ≤FIELD ≤2μT, ■ = FIELD <-2μT

No box visible indicates no data available for that day.

Note: Data are taken daily at 2000 UT. Dates given are not Bartels Rotation dates. These earlier dates correspond to the occurrence of phenomena on the sun which affect the Earth during the given Bartels Rotation.

STANFORD MEAN SOLAR MAGNETIC FIELD (MICROTESLA)

	1977										1978	
	MARCH	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.
DAY												
01	2	-7	-13	13	2	-16	-9	9	6	-14	.	16
02	0	-17	-6	15	-12	-23	-13	6	1	-10	.	31
03	-2	-16	-5	15	-18	-25	.	3	-14	-7	14	26
04	-9	-12	1	13	-26	-23	3	13	-16	8	31	.
05	-17	-9	7	0	-31	-16	12	13	-11	26	.	-5
06	-22	-4	11	-19	-33	-5	18	11	-1	46	27	4
07	-20	0	7	-32	-26	-1	22	-6	11	55	15	9
08	-13	5	-5	-31	-14	11	17	-13	31	53	.	.
09	-9	8	.	.	-7	25	8	-13	46	46	-1	.
10	-3	2	-22	0	3	20	4	-4	48	26	11	-28
11	3	-4	.	7	20	17	6	2	51	.	0	-43
12	11	-7	-29	17	29	12	13	12	32	-2	.	.
13	18	-14	-20	28	30	11	19	28	14	10	.	-41
14	3	-8	-5	38	24	5	23	35	-4	.	.	-23
15	.	-8	4	40	26	7	40	46	-10	1	.	3
16	-9	-11	12	31	18	.	.	39	-18	-6	0	.
17	-12	-9	20	24	13	5	38	20	-24	.	-3	31
18	-13	1	29	18	4	13	41	6	-5	6	.	22
19	-15	13	27	19	1	19	31	6	-11	8	.	37
20	-12	18	19	16	-1	23	17	1	-12	.	18	22
21	-7	21	12	10	6	24	2	3	.	.	39	-1
22	2	13	.	2	9	22	-3	7	-7	.	10	-18
23	.	17	1	-2	22	18	-2	3	-4	-5	-4	-49
24	15	9	-1	-7	25	8	-6	-3	0	-1	-15	.
25	13	6	4	-15	31	4	-1	-9	2	.	-17	.
26	13	9	-10	-10	30	0	-3	-5	4	.	-36	.
27	10	7	-10	4	24	2	-8	-5	7	.	-48	-34
28	8	2	-10	15	6	-2	.	-6	5	.	-33	.
29	4	-10	-4	19	4	-6	-8	5	-2	-9	-15	
30	7	-11	3	14	-4	-6	3	6	-11	.	14	
31	6		6		-10	-11		8		-20	10	

Dot symbol entry indicates no data available for the day.

Solar Proton Event (Provisional) February 1978

Date/Time(UT)	Detector	Observation	Remarks
13/0144	Hα patrol.	Start time of importance Sb(M7) flare; N22W13.	Max 0255 UT; end 0334 UT; McMath Region 15139. Peak 10-cm flux was 720 units above background. Accompanied by Type II event.
13/0915	SMS-2 >1 and >10 MeV proton channels.	Onset of sharp rise in proton fluxes.	Flux computed from differential energy channels on board the Synchronous Meteorological Satellite (SMS)-2.
13/0930	SMS-2 >10 MeV channel.	Proton event threshold exceeded.	Threshold set at 10 protons/cm^2 s sr.
13/2115	Thule and Alaskan 30 MHz riometer chain.	Station / A(dB) / L: Anchorage 0.1 4.2; Sheep Mt. 0.5 4.5; Paxson 1.0 5.0; College 3.8 5.5; Ft. Yukon 2.9 6.5; Thule 1.1 >50	Sample profile near maximum absorption for the day under daylight conditions. Twilight prevailed at Thule.
~14/1000	SM2-2 >10 MeV proton channel.	Max proton flux about 850 particles/cm^2 s sr.	
14/1630	Thule 30 MHz riometer.	Max absorption 2.3 dB.	May not be absolute Max since data for the last 6 hours of the day are missing. Twilight solar illumination.
14/2135	Fredericksburg magnetometer.	Storm sudden commencement (ssc).	Represents a 44-hour delay between the initiating 13/0144 UT flare and the shock front passage. Storm duration about 18 hours.
14/2135	SMS-2 >1 and >10 MeV channels.	Sharp increase in flux.	Arrival of energetic storm particles.
15/0755		Auroral sighting, Boulder, Colorado.	Very intense aurora observed in the northeastern sky. Boulder located at N40° geographic latitude.
15/1200	SMS-2 >10 MeV window.	Particle flux dropped below 10 protons/cm^2 s sr.	Flux below threshold used to define proton event.
15/2400	Fredericksburg Geomagnetic Center.	A index = 32.	Largest K value was 7, occurring between 0900 and 1200 UT.

Dot symbol entry indicates no data available for the day.

JANUARY 1978 DATA

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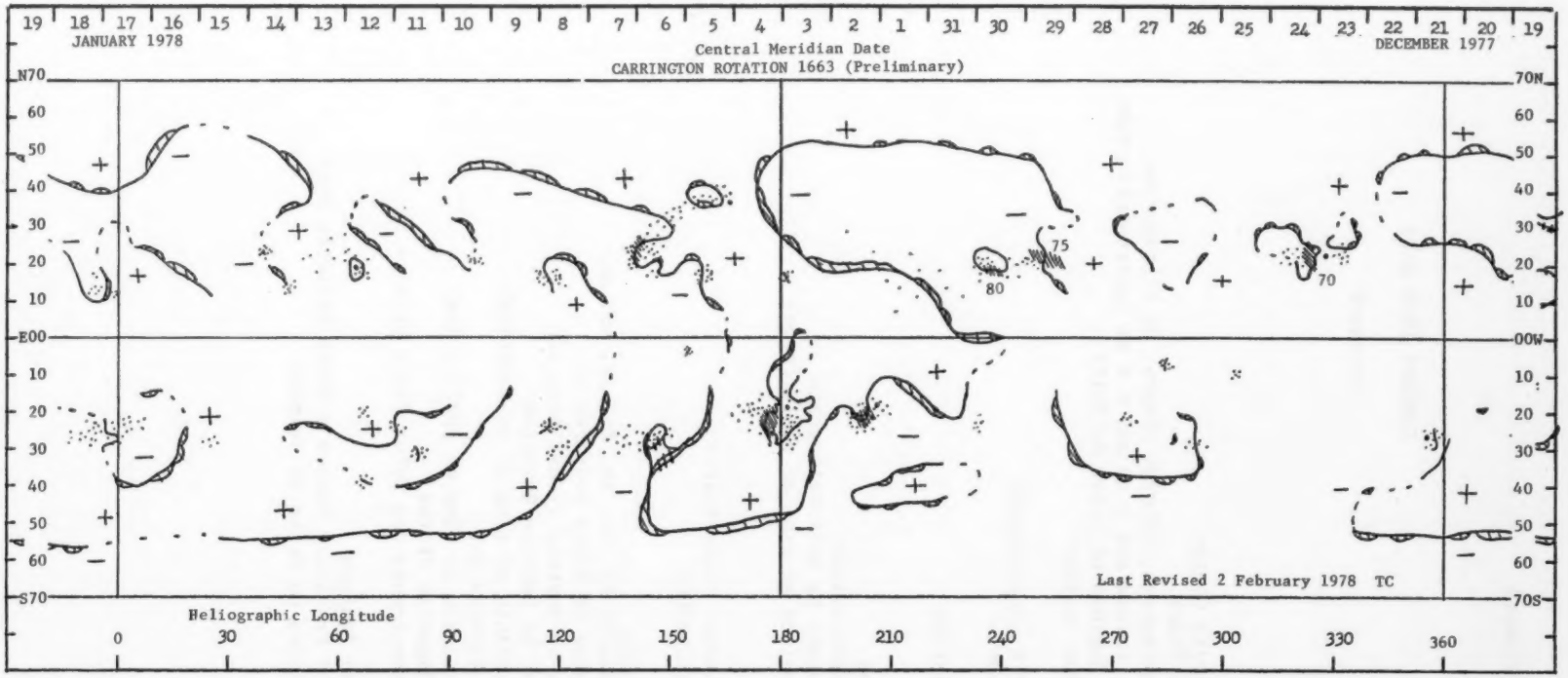
Hα SYNOPTIC CHART

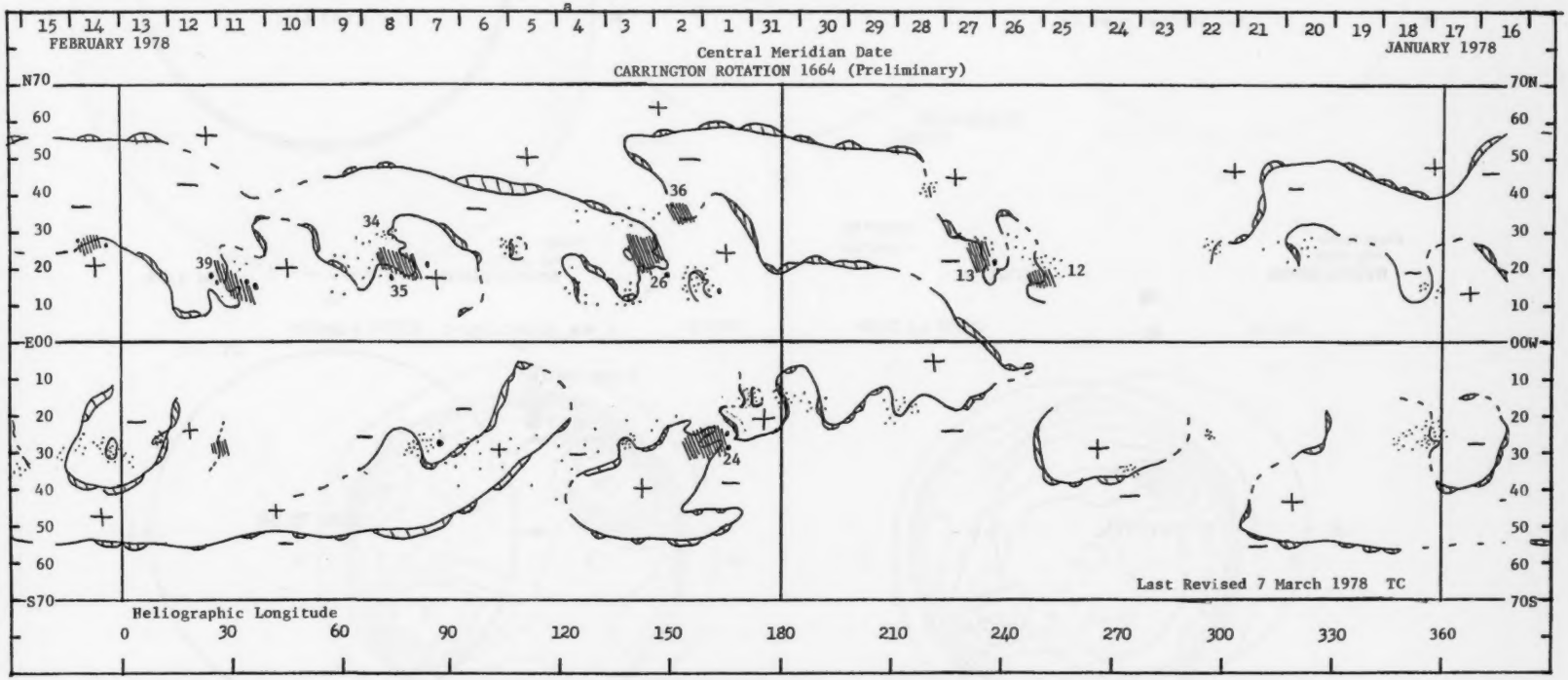
CARRINGTON ROTATION 1663 (PRELIMINARY)



ABBREVIATED CALENDAR RECORD

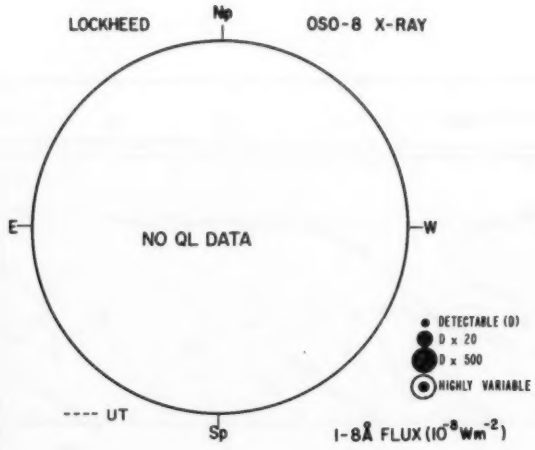
Hα SYNOPTIC CHART

JANUARY - FEBRUARY 1978



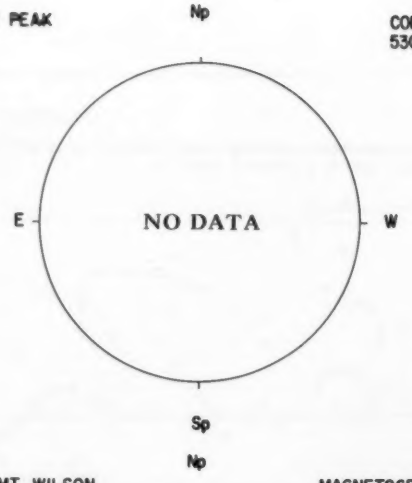
JANUARY 1, 1978 (P =2.19, B_o =-3.03, L_o =220.32)

LOCKHEED OSO-8 X-RAY

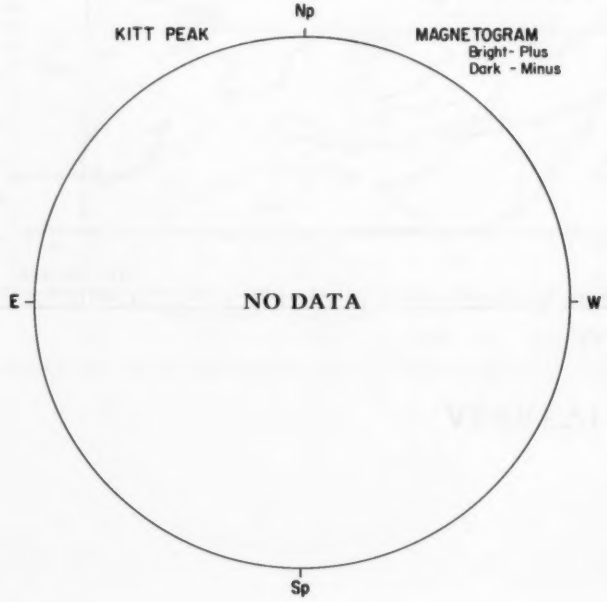


SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å



KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus

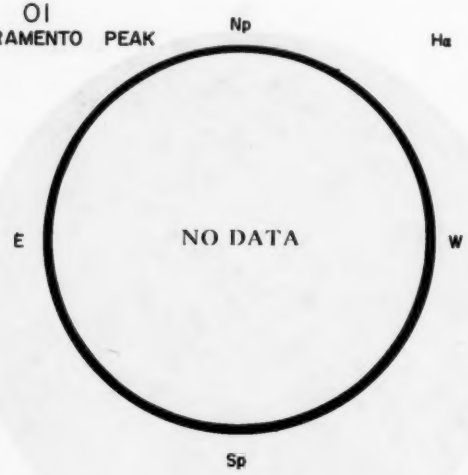


MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus

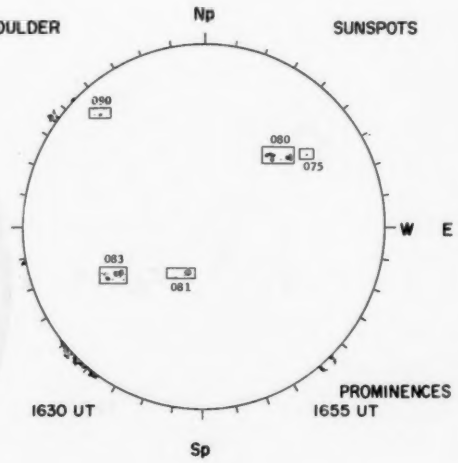
DELTAY =
DELTAX =

Levels
± 5
± 10
± 20
± 40
± 80

01
SACRAMENTO PEAK



Ha BOULDER

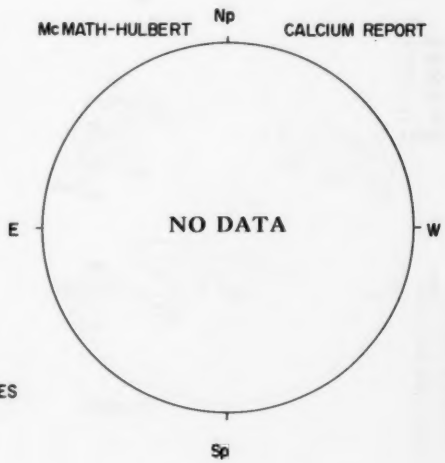


1630 UT

SUNSPOTS

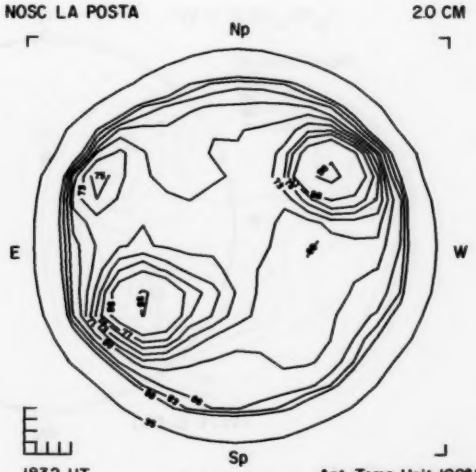
PROMINENCES
1655 UT

McMATH-HULBERT



CALCIUM REPORT

NOSC LA POSTA 2.0 CM



1832 UT

Ant. Temp. Unit 100°K

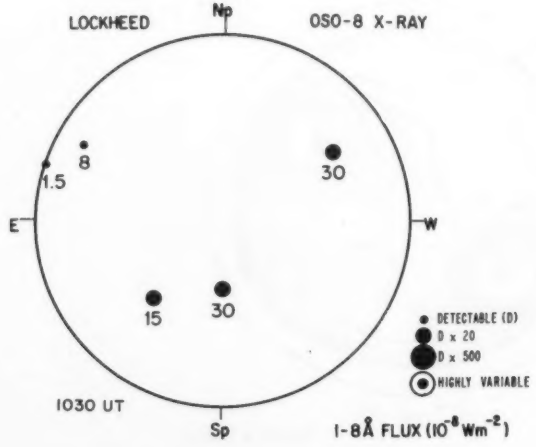
NOSC LA POSTA 8.6 MM

1918 UT

Ant. Temp. Unit 100°K

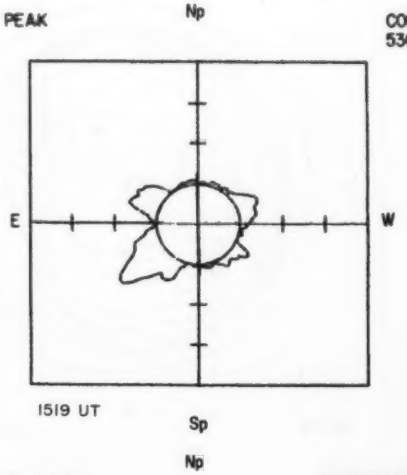
JANUARY 2, 1978 (P =1.71, B_o =-3.15, L_o =207.15)

LOCKHEED OSO-8 X-RAY

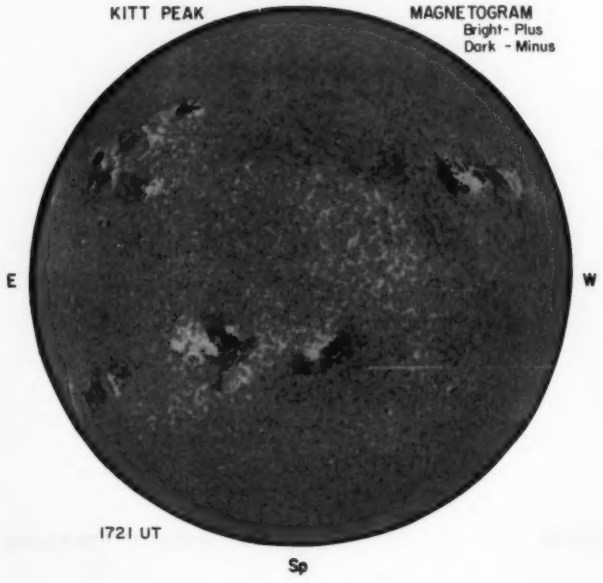


1-8Å FLUX (10^{-8} Wm^{-2})

SACRAMENTO PEAK



KITT PEAK MAGNETOGRAM
Bright- Plus
Dark - Minus



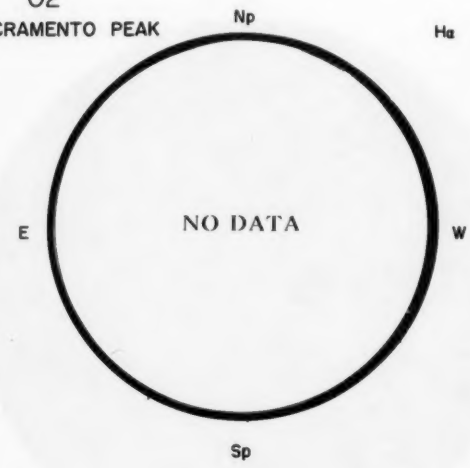
MT. WILSON MAGNETOGRAM
Solid- Plus
Dotted-Minus

DELTAY =
DELTAX =

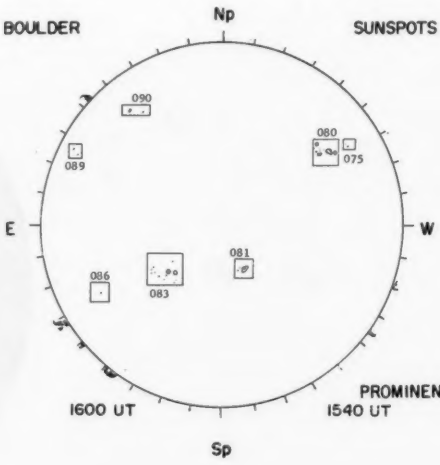
Levels
+ 5
++ 10
+++ 20
++++ 40
+++++ 80

02

SACRAMENTO PEAK



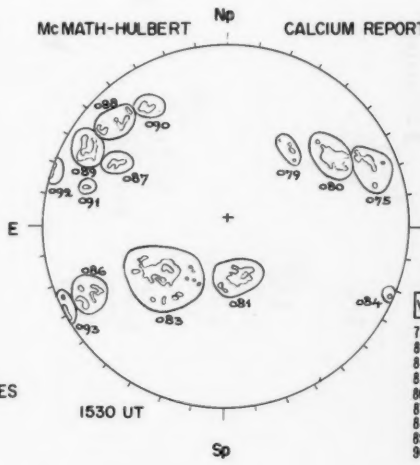
Hα BOULDER



1600 UT

SUNSPOTS

McMATH-HULBERT



1540 UT

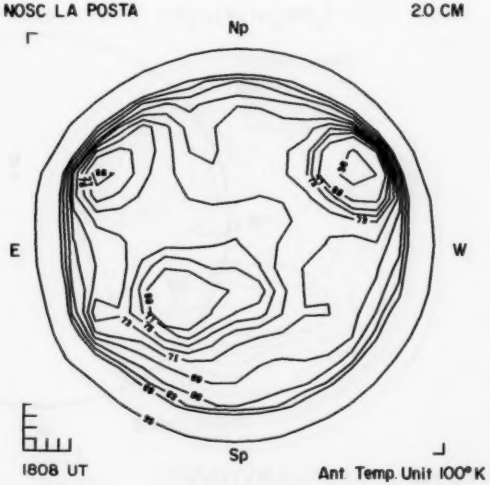
PROMINENCES

1530 UT

CALCIUM REPORT

V POOR	S
75 - 2000 - 2.5	
80 - 2500 - 3.0	
81 - 2100 - 3.0	
83 - 4300 - 3.0	
86 - 2000 - 2.5	
87 - 1400 - 3.0	
88 - 1500 - 2.5	
89 - 2100 - 3.0	
90 - 1000 - 3.0	

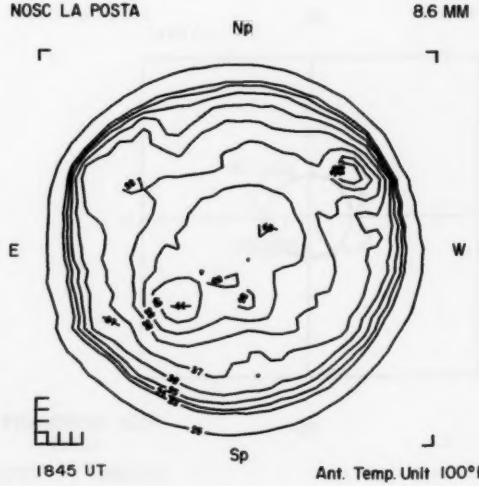
NOSC LA POSTA 2.0 CM



1808 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA 8.6 MM

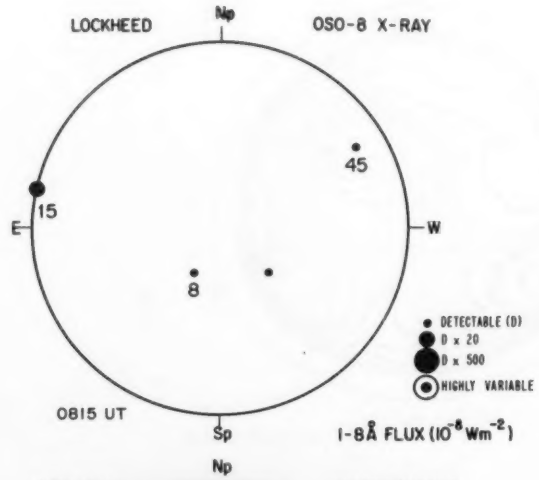


1845 UT

Ant. Temp. Unit 100°K

JANUARY 3, 1978 (P =1.22, B_0 =-3.26, L_0 =193.98)

LOCKHEED OSO-8 X-RAY

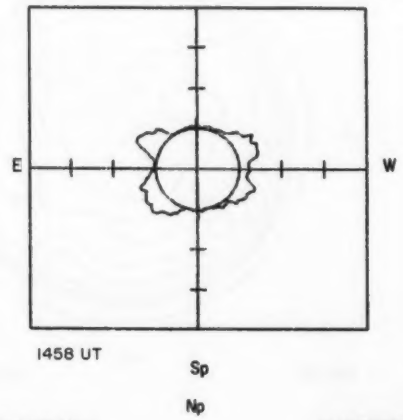


0815 UT

I-8Å FLUX (10^{-6} Wm^{-2})

SACRAMENTO PEAK

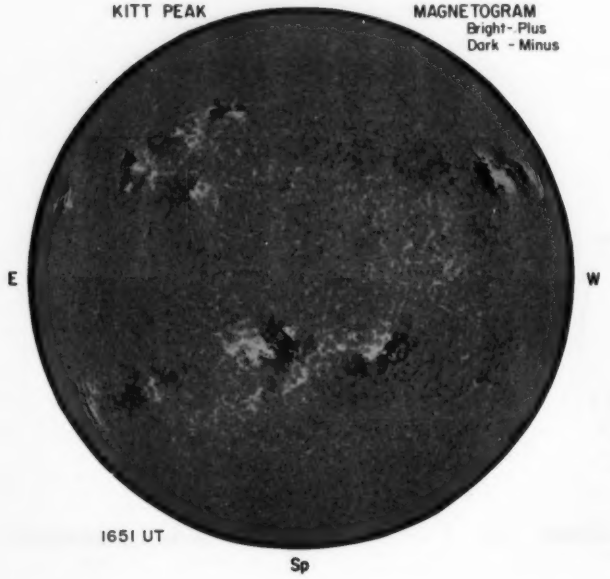
CORONA (1.15 $R_\odot$)
5303 Å



1458 UT

KITT PEAK

MAGNETOGRAM
Bright - Plus
Dark - Minus



1651 UT

MT. WILSON

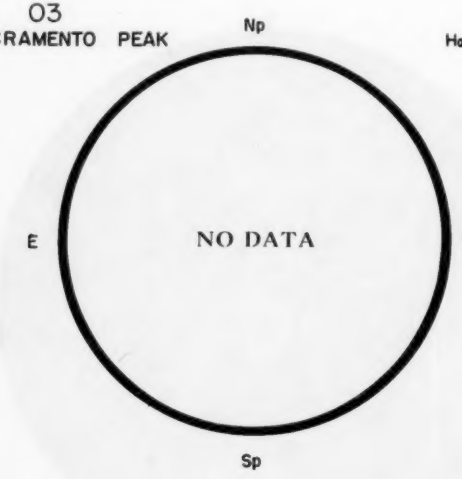
MAGNETOGRAM
Solid - Plus
Dotted - Minus

DELTAY =
DELTAX =

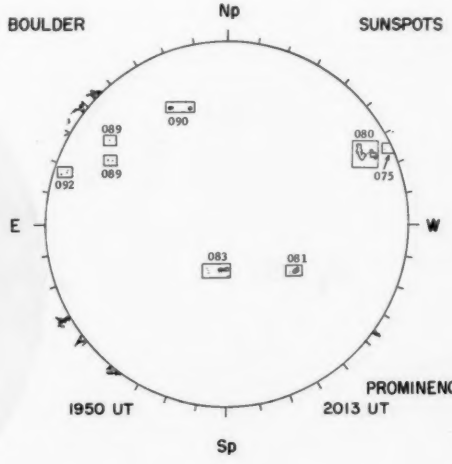
Levels
+ 5
++ 10
+++ 20
++++ 40
+++++ 80

03

SACRAMENTO PEAK



Hα BOULDER



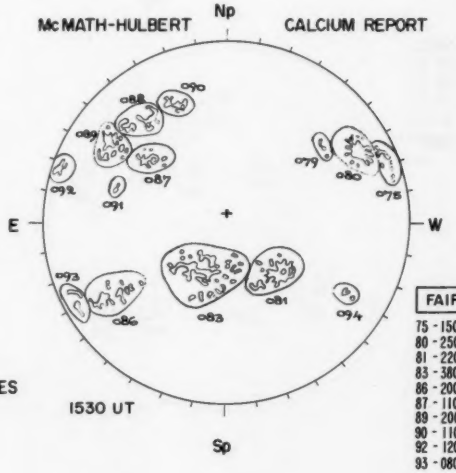
1950 UT

SUNSPOTS

PROMINENCES

2013 UT

McMATH-HULBERT



1530 UT

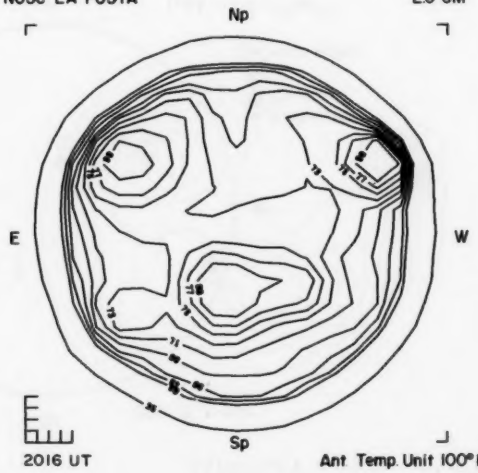
CALCIUM REPORT

FAIR	S

75 - 1500 - 2.5
80 - 2500 - 3.0
81 - 2200 - 3.0
83 - 3800 - 3.0
86 - 2000 - 2.5
87 - 1100 - 3.0
89 - 2000 - 3.0
90 - 1100 - 2.5
92 - 1200 - 3.5
93 - 0800 - 2.5

NOSC LA POSTA

2.0 CM

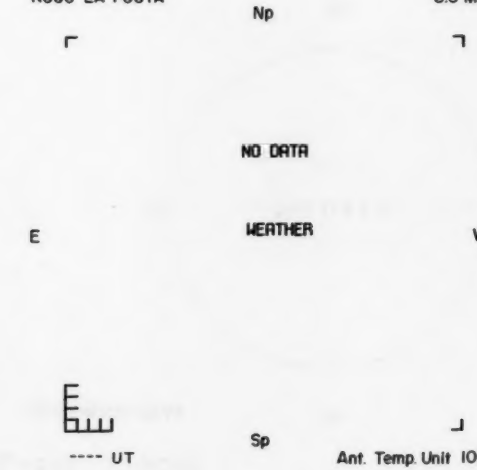


2016 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA

8.6 MM

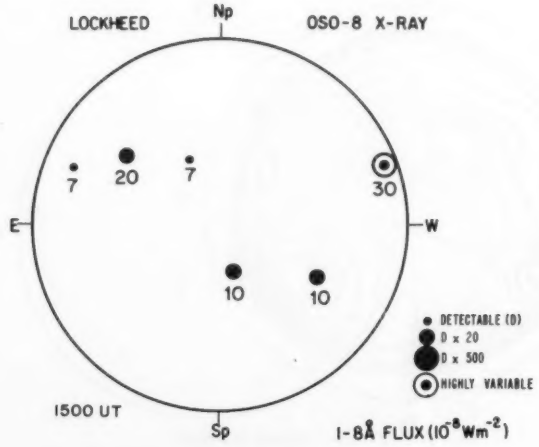


---- UT

Ant. Temp. Unit 100°K

JANUARY 4, 1978 (P =0.74, B_0 =-3.38, L_0 =180.81)

LOCKHEED OSO-8 X-RAY

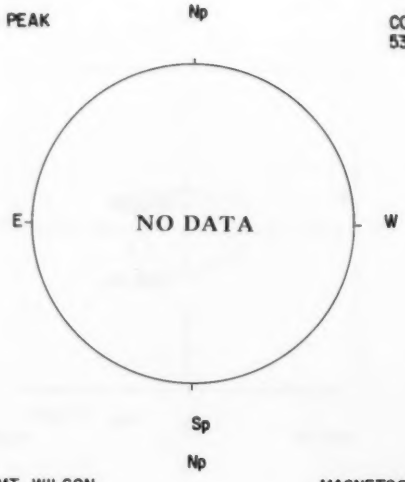


1500 UT

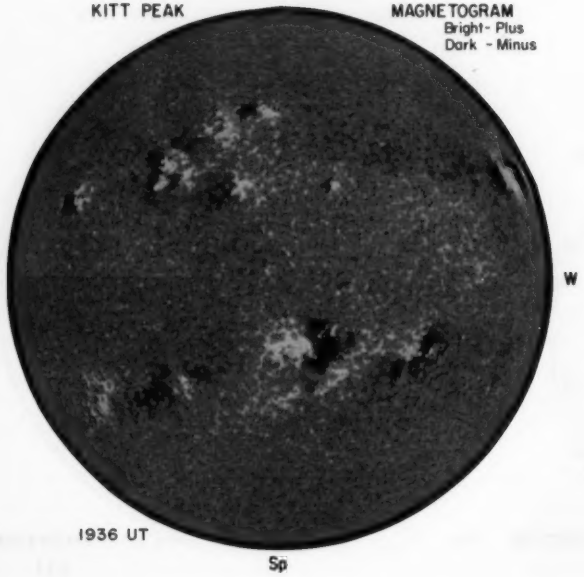
1-8Å FLUX (10^{-8} Wm^{-2})

SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å



KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus



1936 UT

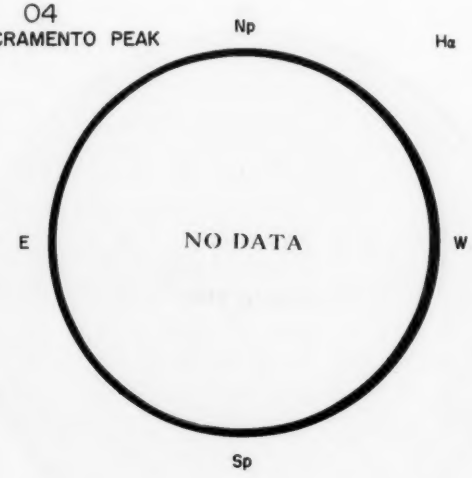
MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus

DELTAY =
DELTAX =

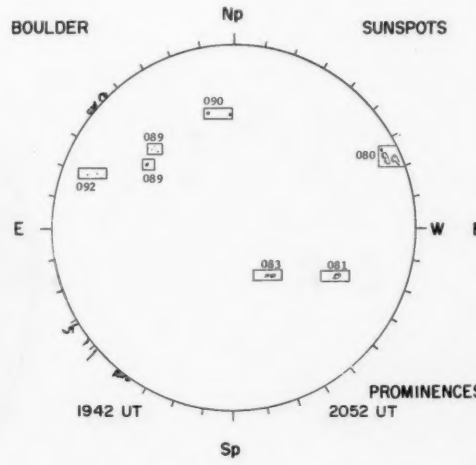
Levels
± 5
± 10
± 20
± 40
± 80

04

SACRAMENTO PEAK



Hα BOULDER



1942 UT

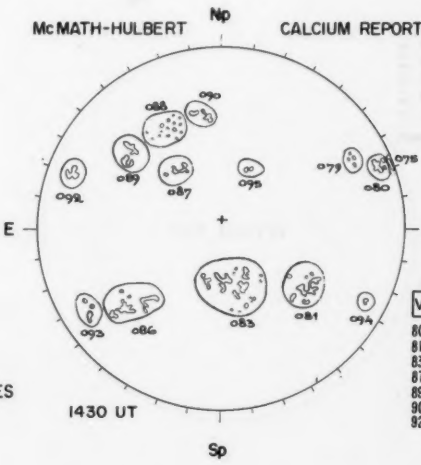
SUNSPOTS

PROMINENCES

2052 UT

McMATH-HULBERT

CALCIUM REPORT

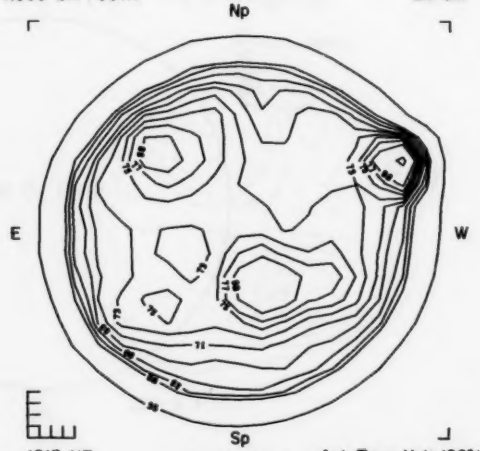


1430 UT

VPOOR	S
80 - 1900 - 3.0	
81 - 1400 - 3.0	
83 - 3200 - 3.0	
87 - 0700 - 3.0	
89 - 1500 - 3.0	
90 - 0700 - 2.5	
92 - 0900 - 3.0	

NOSC LA POSTA

2.0 CM

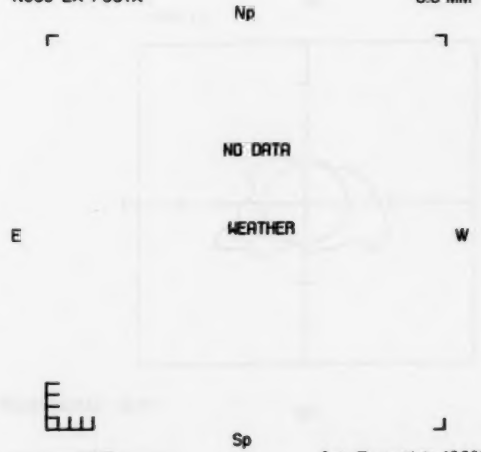


1813 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA

8.6 MM

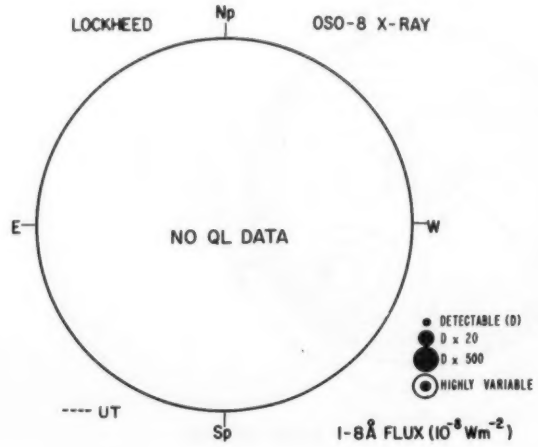


---- UT

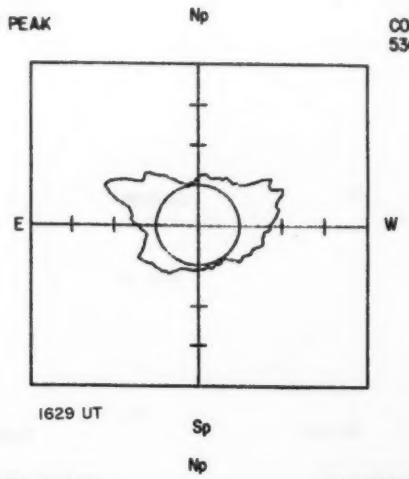
Ant. Temp. Unit 100°K

JANUARY 5, 1978 (P =0.25, B_o =-3.49, L_o =167.64)

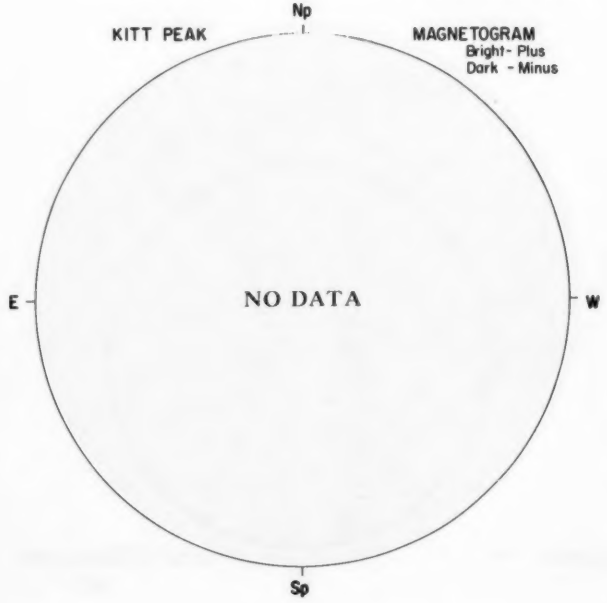
LOCKHEED OSO-8 X-RAY



SACRAMENTO PEAK CORONA (1.15 $R_\odot$) 5303 Å

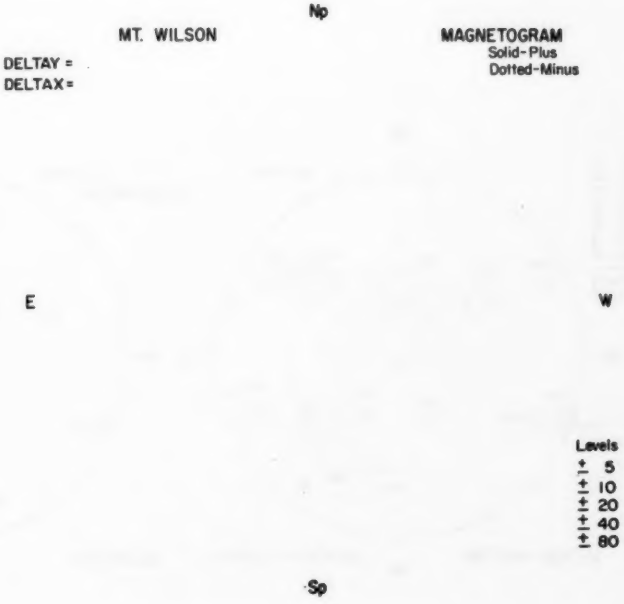


KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus



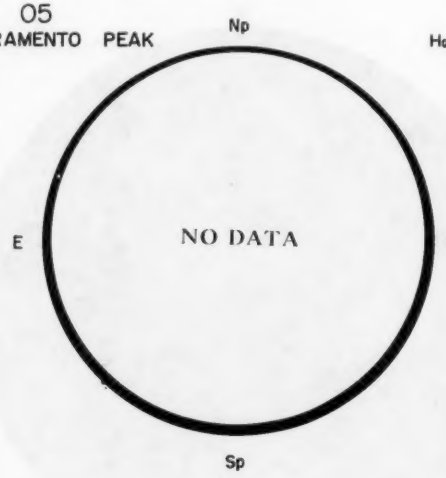
MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus

DELTAY =
DELTAX =

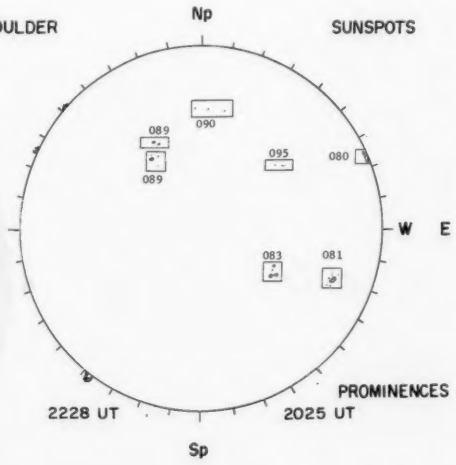


05

SACRAMENTO PEAK



Hα BOULDER



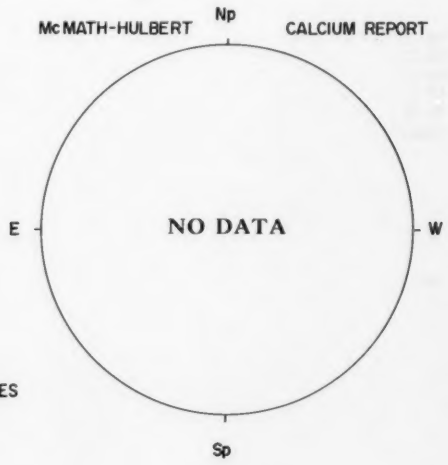
2228 UT

SUNSPOTS

PROMINENCES

2025 UT

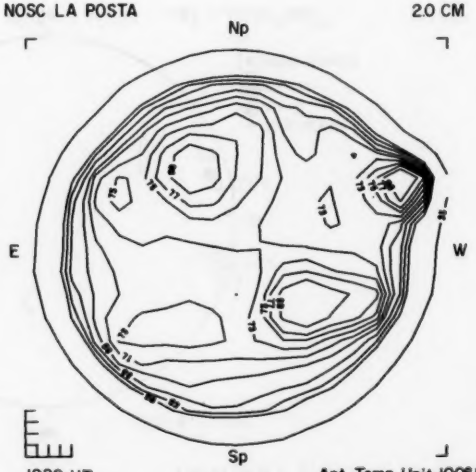
McMATH-HULBERT



CALCIUM REPORT

NOSC LA POSTA

2.0 CM



1929 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA

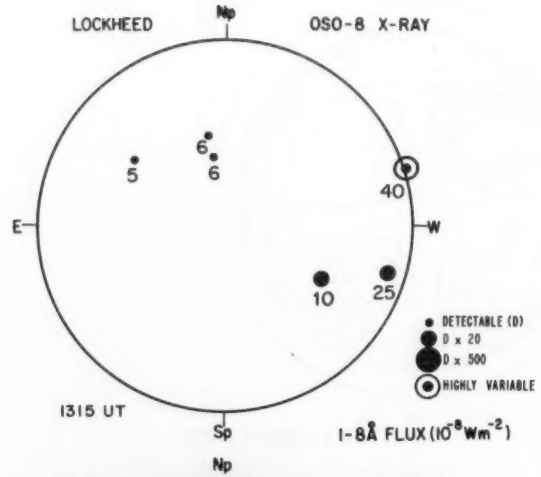
8.6 MM

---- UT

Ant. Temp. Unit 100°K

JANUARY 6, 1978 (P =-0.23, B_o =-3.60, L_o =154.47)

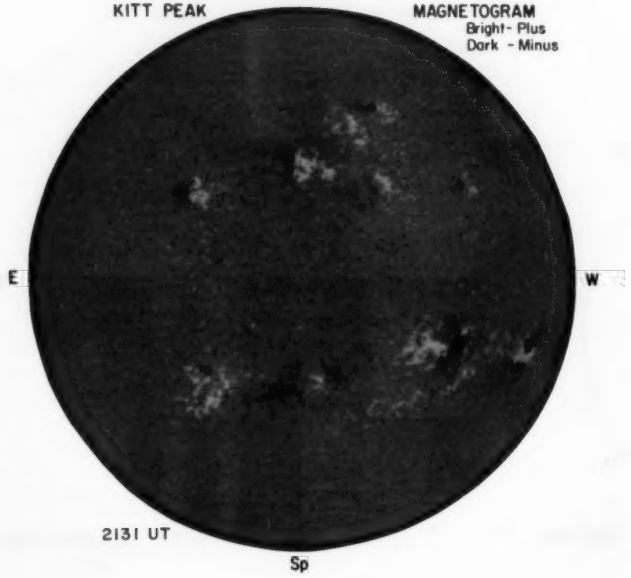
LOCKHEED OSO-8 X-RAY



1-8Å FLUX (10^{-8} Wm^{-2})

SACRAMENTO PEAK

KITT PEAK MAGNETOGRAM
Bright - Plus
Dork - Minus

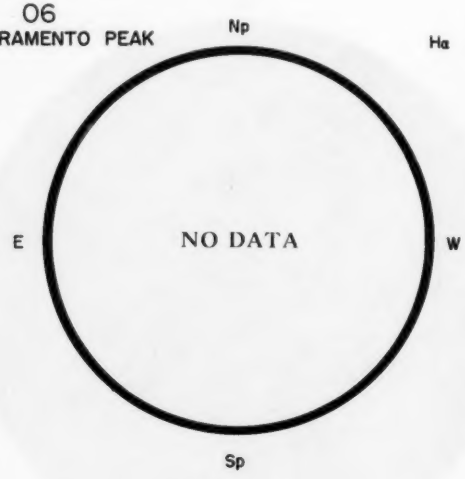


MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus

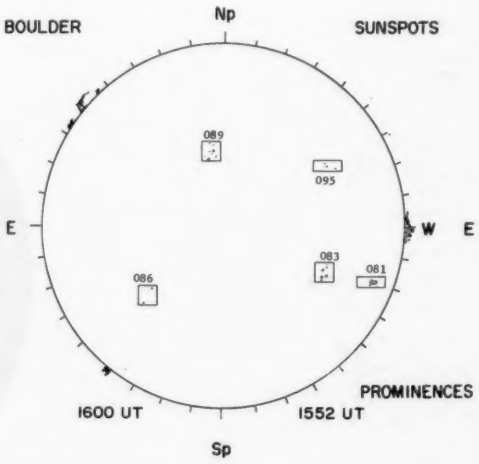
DELTAY =
DELTAX =

06

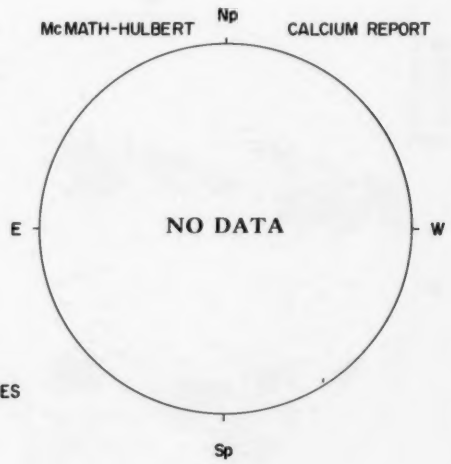
SACRAMENTO PEAK Hα



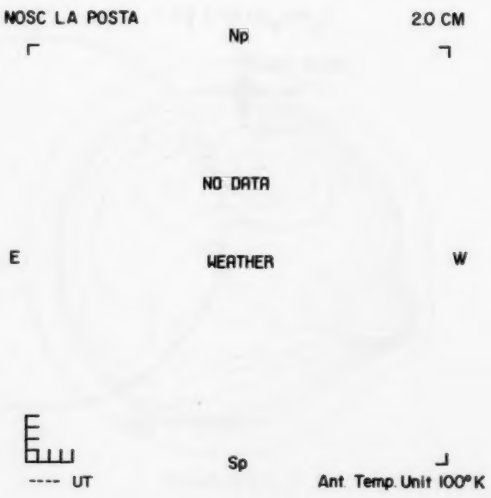
BOULDER SUNSPOTS



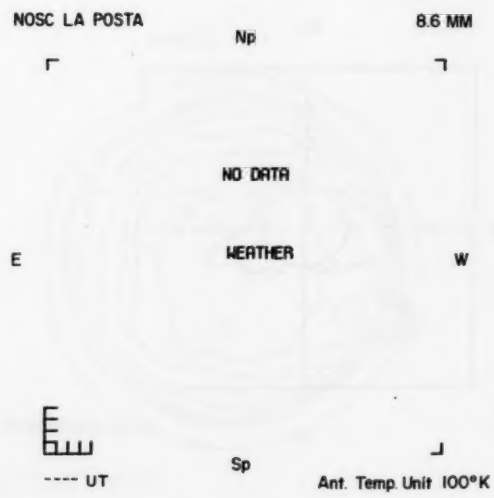
McMATH-HULBERT CALCIUM REPORT



NOSC LA POSTA 2.0 CM

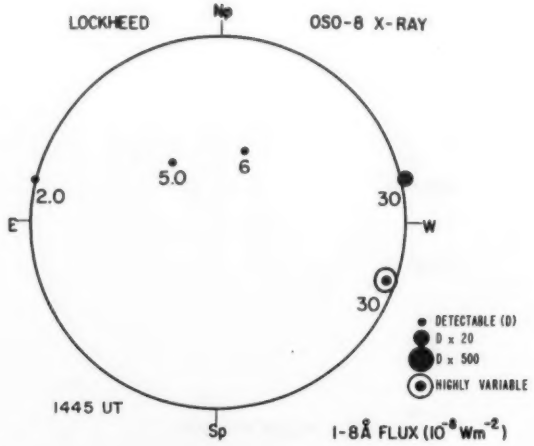


NOSC LA POSTA 8.6 MM



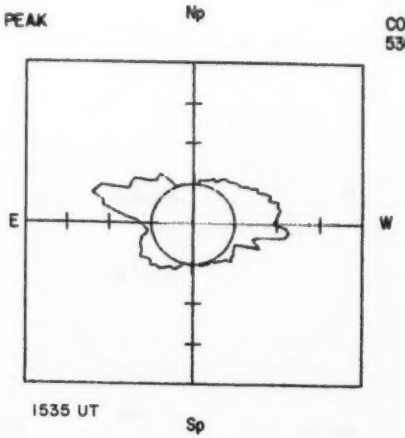
JANUARY 7, 1978 (P =-0.72, B_o =-3.71, L_o =141.30)

LOCKHEED OSO-8 X-RAY

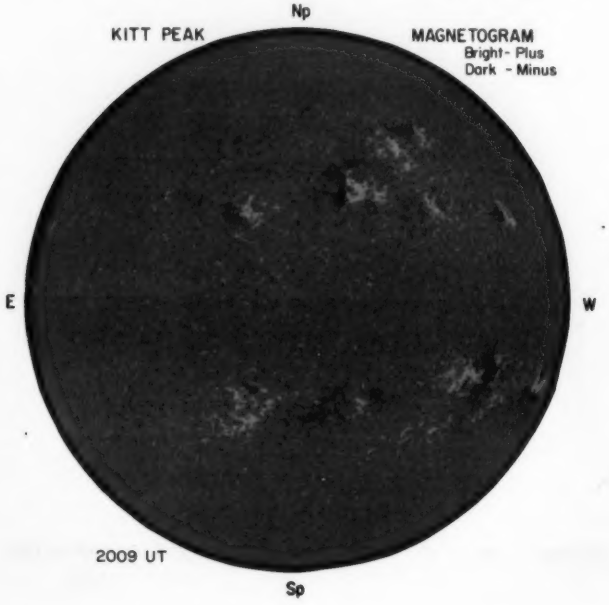


1-8Å FLUX (10^{-6} Wm^{-2})

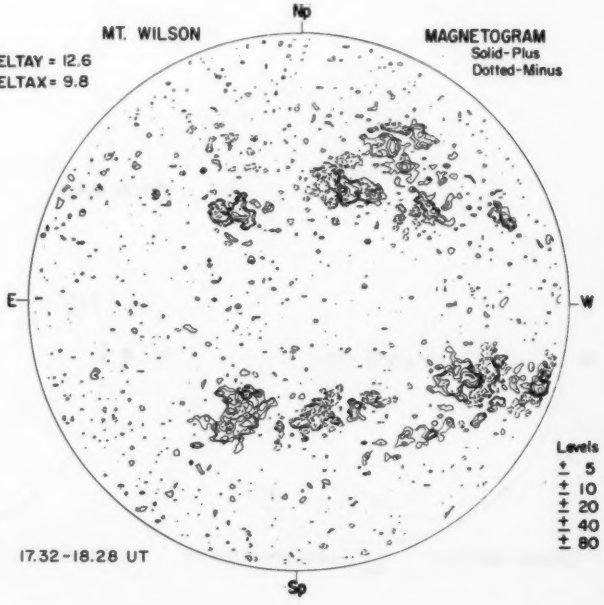
SACRAMENTO PEAK



KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus

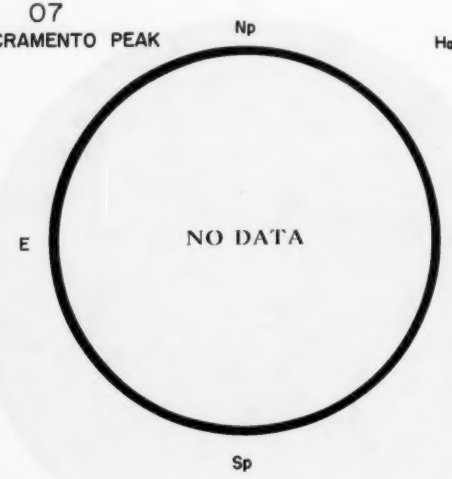


MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus
DELTAY = 12.6
DELTAX = 9.8

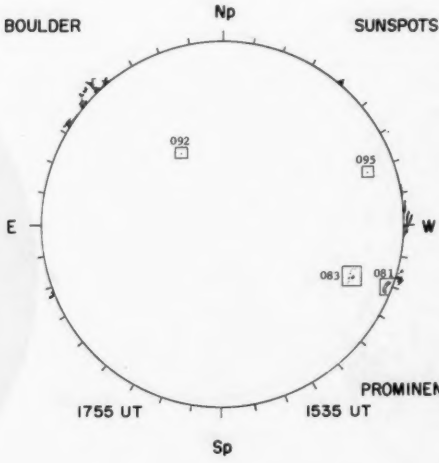


07

SACRAMENTO PEAK



Hα BOULDER



1755 UT

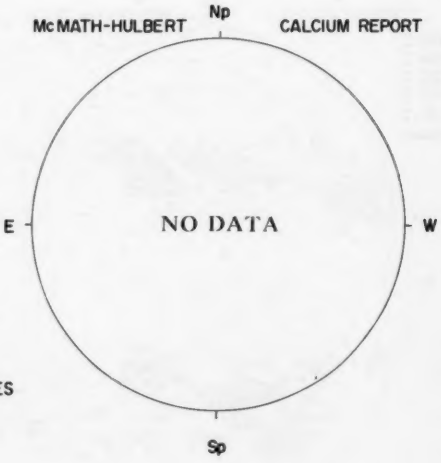
SUNSPOTS

PROMINENCES

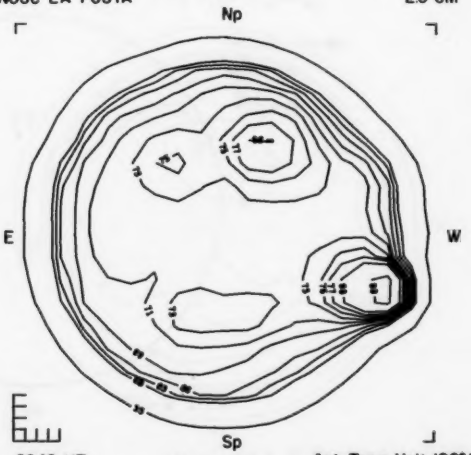
1535 UT

McMATH-HULBERT

CALCIUM REPORT



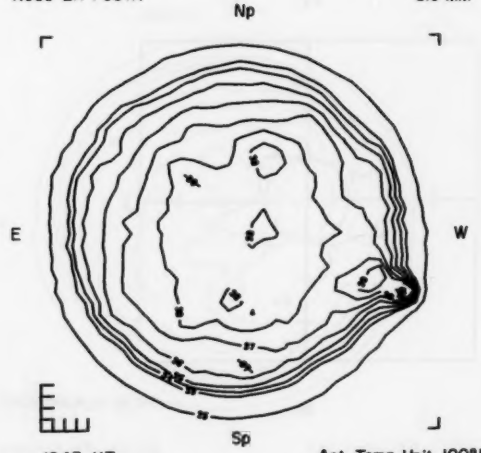
NOSC LA POSTA 2.0 CM



2049 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA 8.6 MM

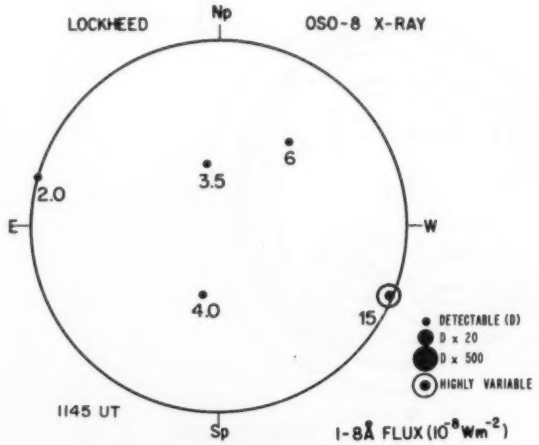


1943 UT

Ant. Temp. Unit 100°K

JANUARY 8, 1978 (P =-1.20, B_o =-3.82, L_o =128.13)

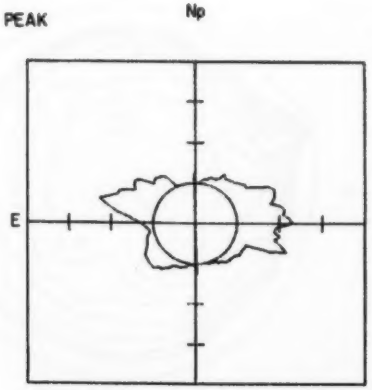
LOCKHEED OSO-8 X-RAY



1145 UT

1-8Å FLUX (10^{-8} Wm^{-2})

SACRAMENTO PEAK



CORONA (1.15 $R_\odot$)
5303 Å

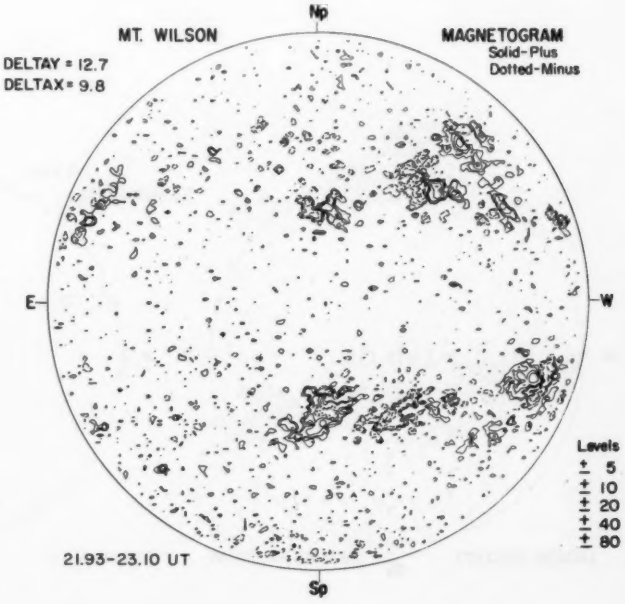
1518 UT

KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus

2054 UT

MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus

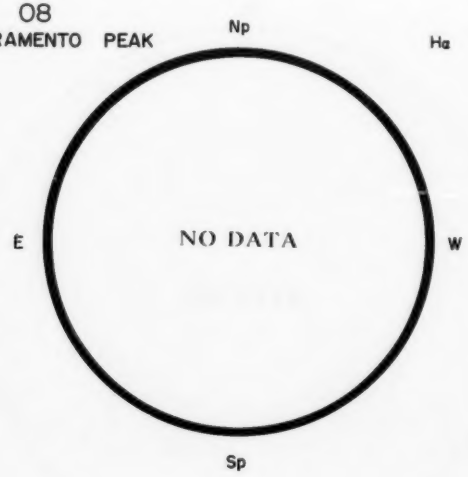
DELTAY = 12.7
DELTAX = 9.8



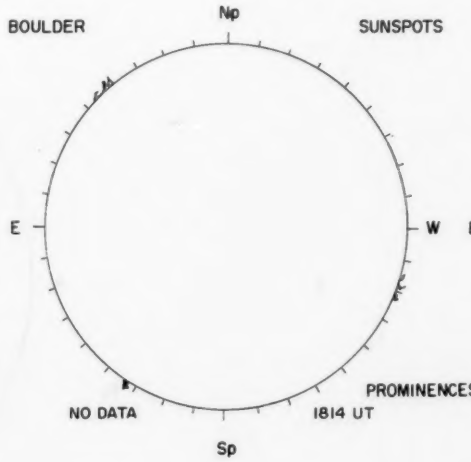
21.93-23.10 UT

08

SACRAMENTO PEAK

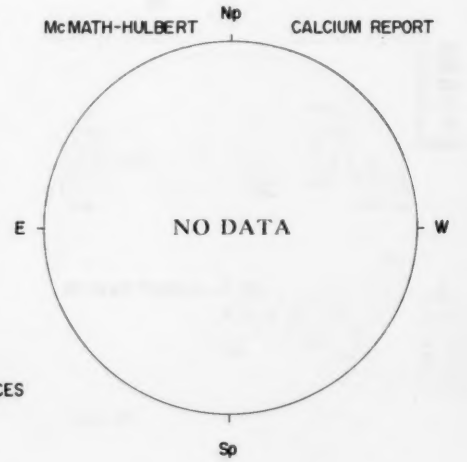


Hα BOULDER



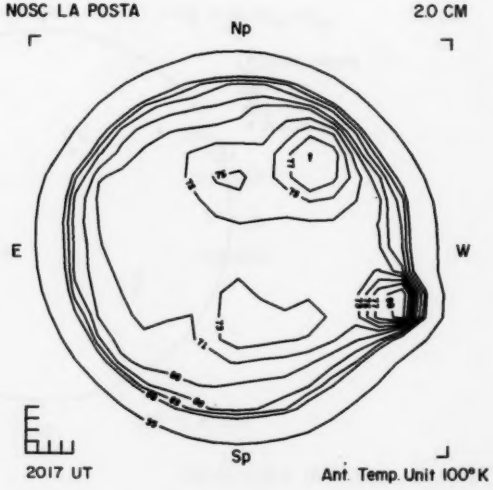
SUNSPOTS

McMATH-HULBERT

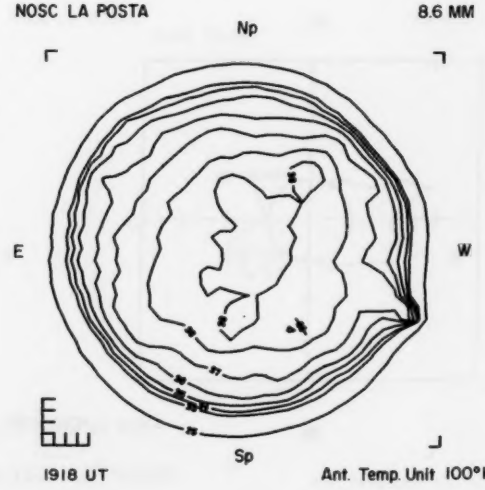


CALCIUM REPORT

NOSC LA POSTA 2.0 CM

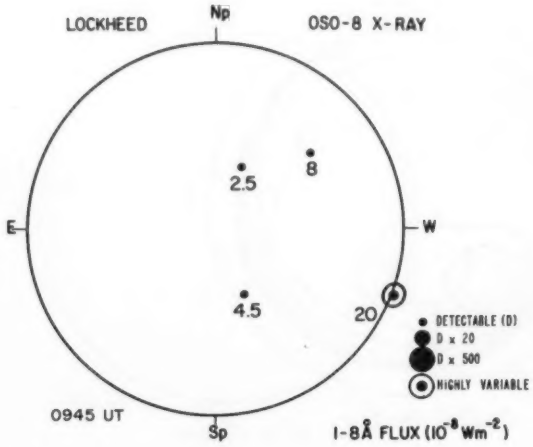


NOSC LA POSTA 8.6 MM



JANUARY 9, 1978 (P =-1.68, B_o =-3.93, L_o =114.96)

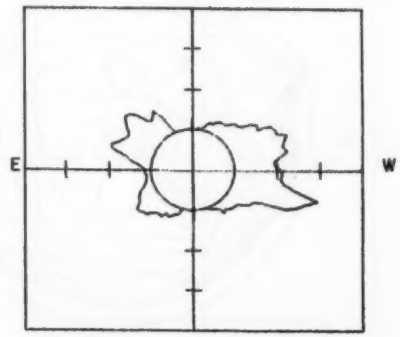
LOCKHEED OSO-8 X-RAY



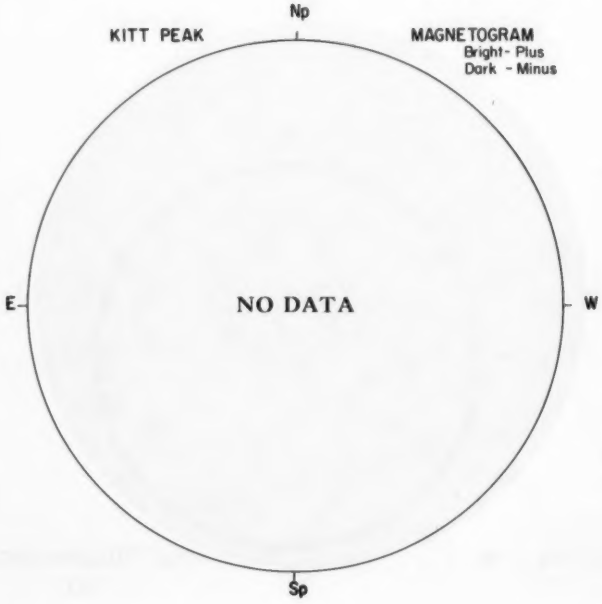
1-8Å FLUX (10^{-8} Wm^{-2})

SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å

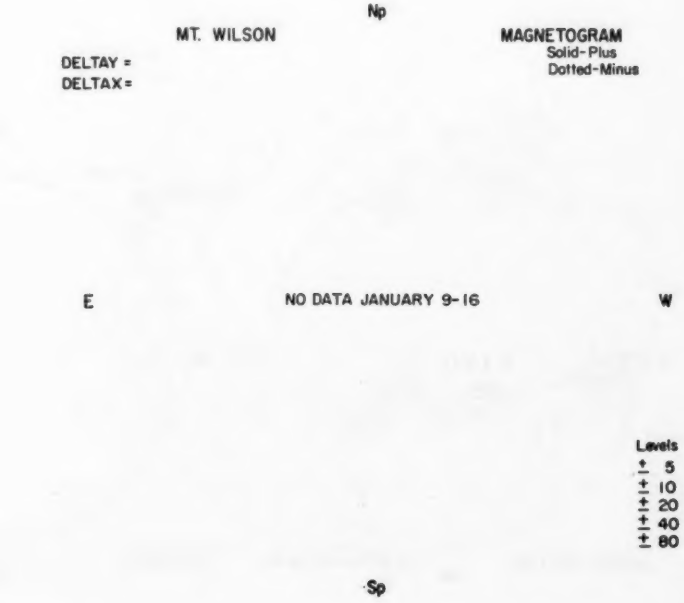


KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus



MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus

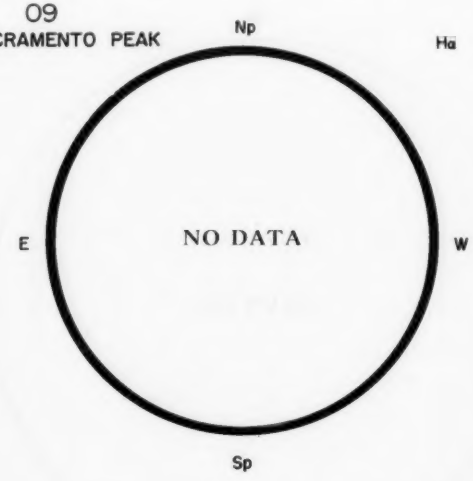
DELTAY =
DELTAX =



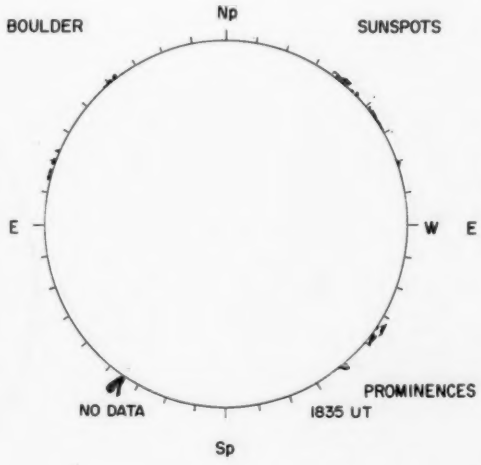
Levels
± 5
± 10
± 20
± 40
± 80

09

SACRAMENTO PEAK



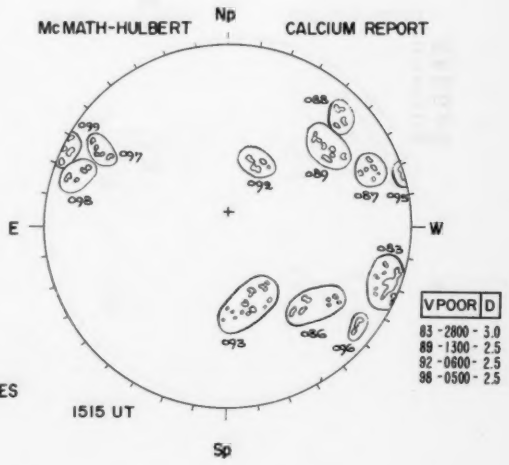
Hα BOULDER



SUNSPOTS

McMATH-HULBERT

CALCIUM REPORT



VPOOR	D
83 - 2800 - 3.0	
89 - 1300 - 2.5	
92 - 0600 - 2.5	
98 - 0500 - 2.5	

NOSC LA POSTA

Np

2.0 CM

NOSC LA POSTA

Np

8.6 MM

NO DATA

E

WEATHER

W

NO DATA

E

WEATHER

W

---- UT

Sp

Ant. Temp. Unit 100°K

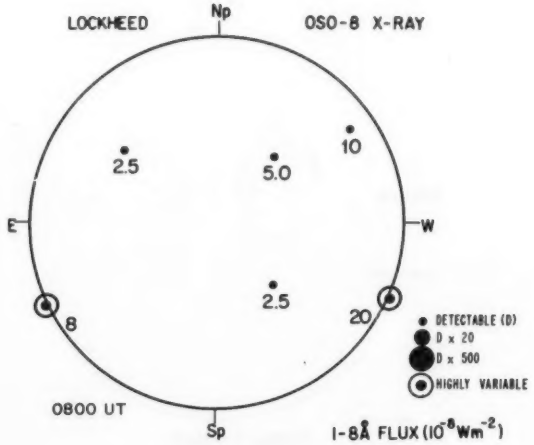
---- UT

Sp

Ant. Temp. Unit 100°K

JANUARY 10, 1978 (P =-2.16, B_o =-4.01, L_o =101.80)

LOCKHEED OSO-8 X-RAY



0800 UT

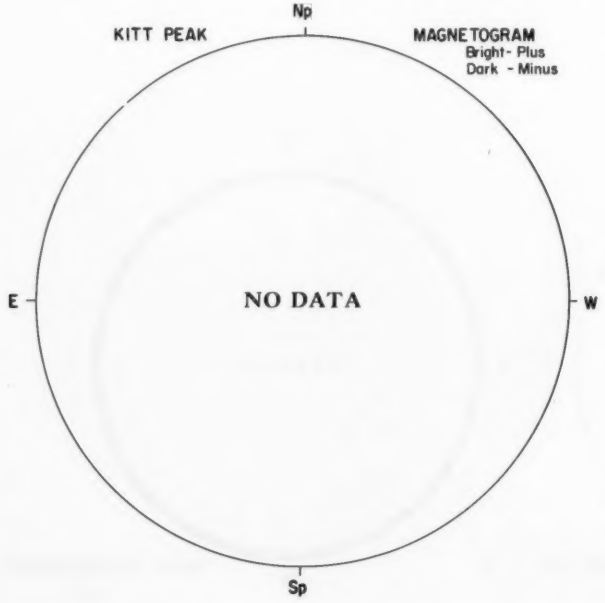
1-8Å FLUX (10^{-8} Wm^{-2})

SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å

KITT PEAK

MAGNETOGRAM
Bright - Plus
Dark - Minus



MT. WILSON

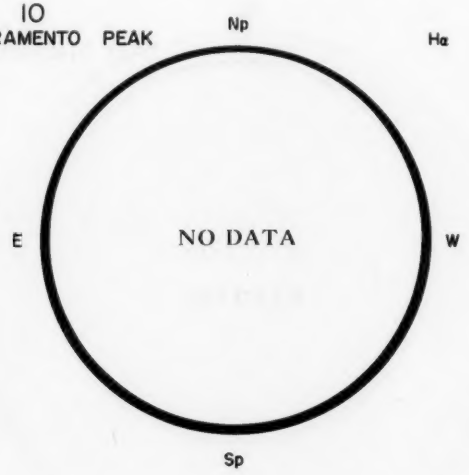
MAGNETOGRAM
Solid - Plus
Dotted - Minus

DELTAY =
DELTAX =

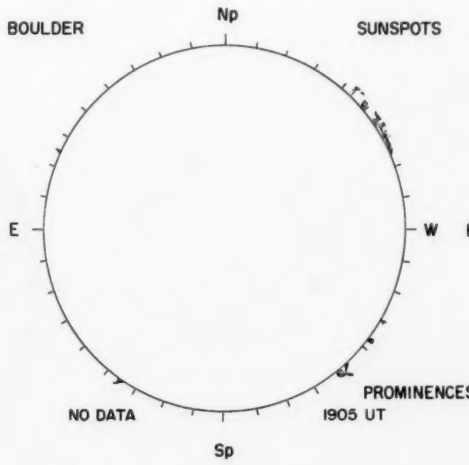
Levels
± 5
± 10
± 20
± 40
± 80

10

SACRAMENTO PEAK

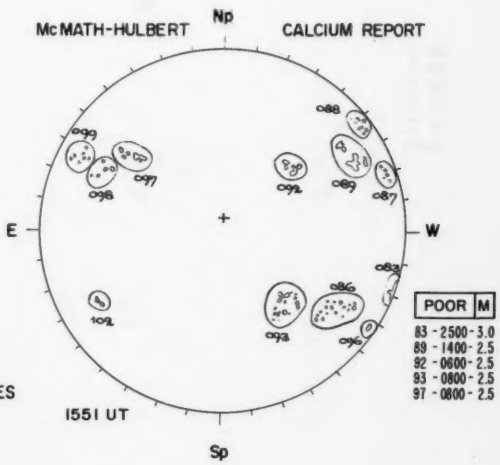


BOULDER



SUNSPOTS

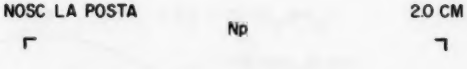
McMATH-HULBERT



CALCIUM REPORT

POOR	M
83 - 2500 - 3.0	
89 - 1400 - 2.5	
92 - 0600 - 2.5	
93 - 0800 - 2.5	
97 - 0800 - 2.5	

NOSC LA POSTA

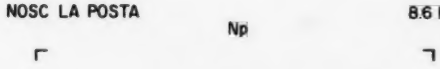


2.0 CM

---- UT

Ant. Temp. Unit 100°K

NOSC LA POSTA



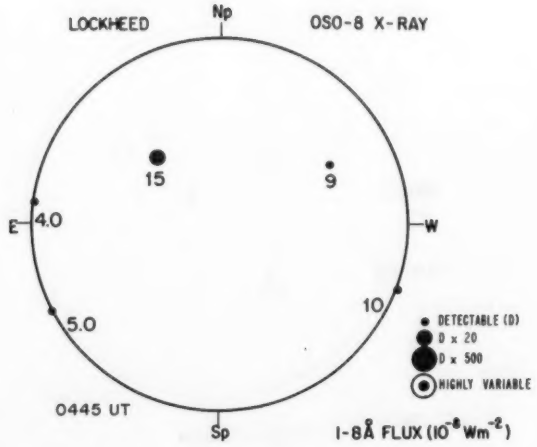
8.6 MM

---- UT

Ant. Temp. Unit 100°K

JANUARY 11, 1978 (P =-2.64, B_o =-4.15, L_o =88.63)

LOCKHEED OSO-8 X-RAY

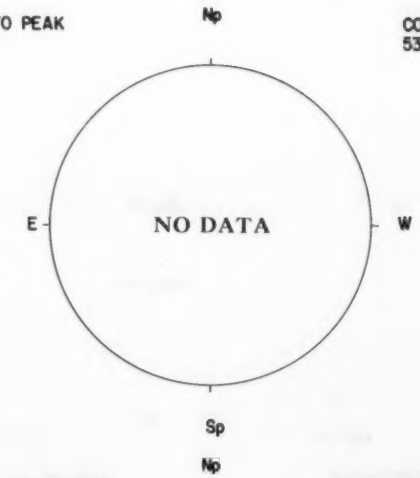


0445 UT

1-8Å FLUX (10^{-8} Wm^{-2})

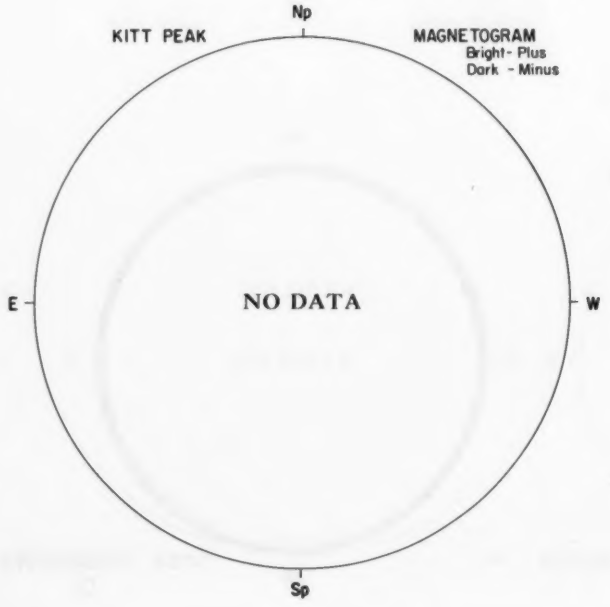
SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å



KITT PEAK

MAGNETOGRAM
Bright - Plus
Dark - Minus



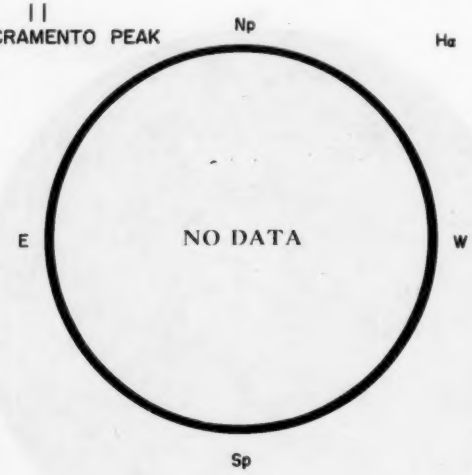
MT. WILSON

MAGNETOGRAM
Solid - Plus
Dotted - Minus

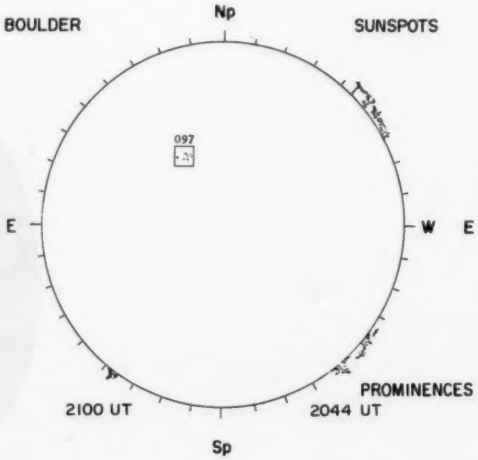
DELTAY =
DELTAX =

Levels
± 5
± 10
± 20
± 40
± 80

SACRAMENTO PEAK



Hα BOULDER



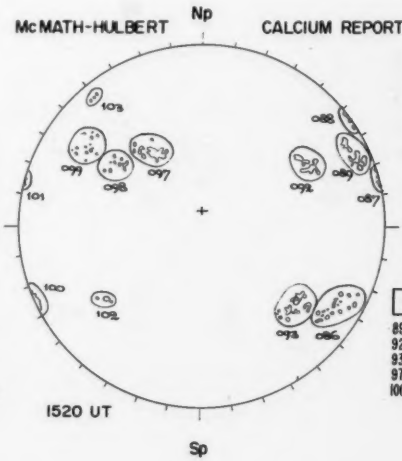
2100 UT

SUNSPOTS

PROMINENCES

2044 UT

McMATH-HULBERT

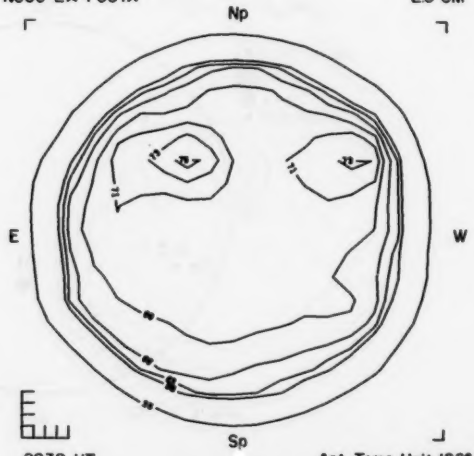


1520 UT

CALCIUM REPORT

FAIR	M
89 - 1500 -	3.0
92 - 0800 -	2.5
93 - 0900 -	2.5
97 - 1100 -	3.0
100 - 1800 -	3.5

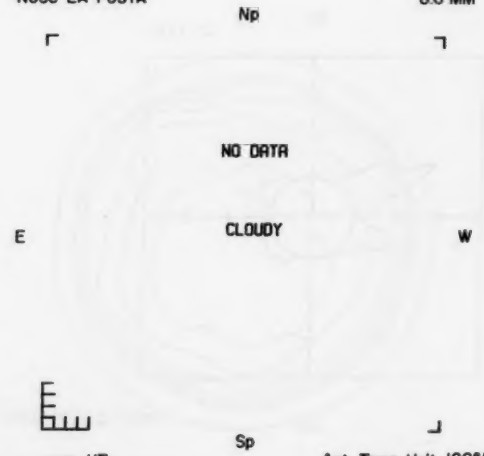
NOSC LA POSTA 2.0 CM



2039 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA 8.6 MM



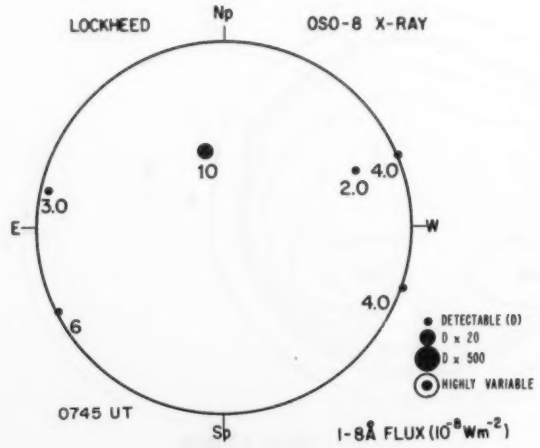
---- UT

Ant. Temp. Unit 100°K

67
Jan 78

JANUARY 12, 1978 (P =-3.12 B_o =-4.25, L_o =75.46)

LOCKHEED OSO-8 X-RAY

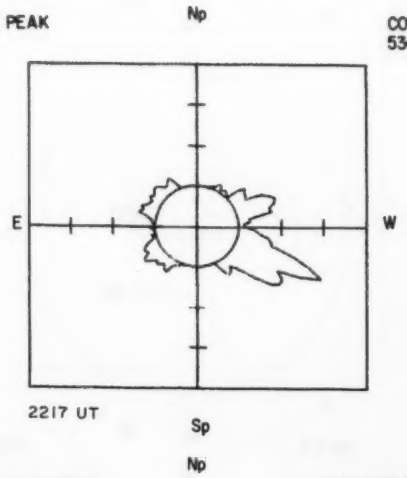


0745 UT

1-8Å FLUX (10^{-8} Wm^{-2})

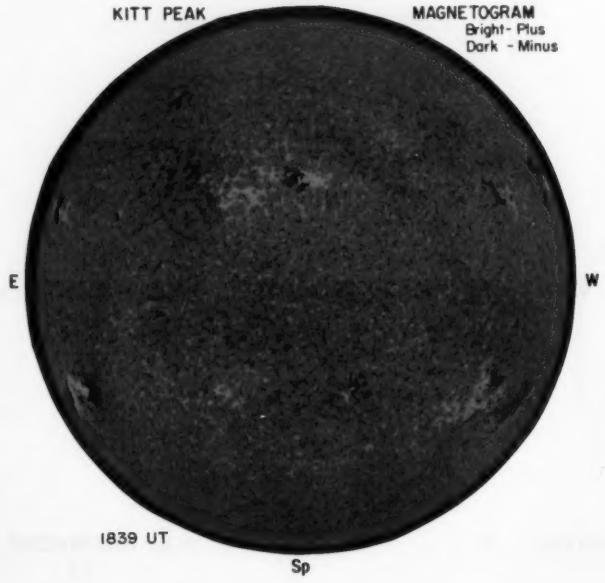
SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å



2217 UT

KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus



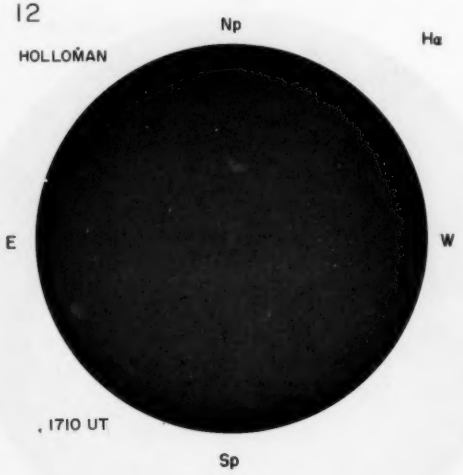
1839 UT

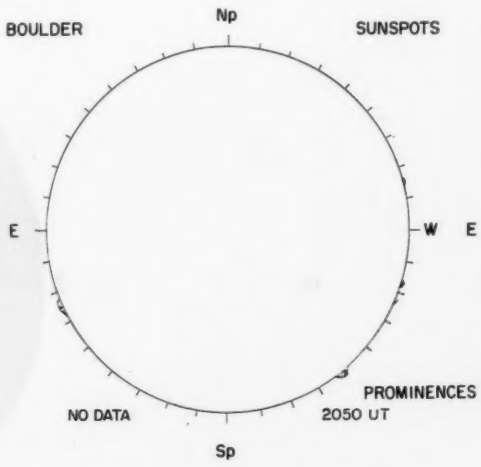
MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus

DELTAY =
DELTAX =

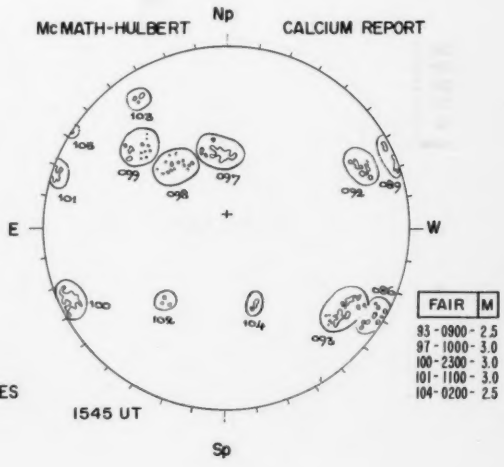
Levels
± 5
± 10
± 20
± 40
± 80

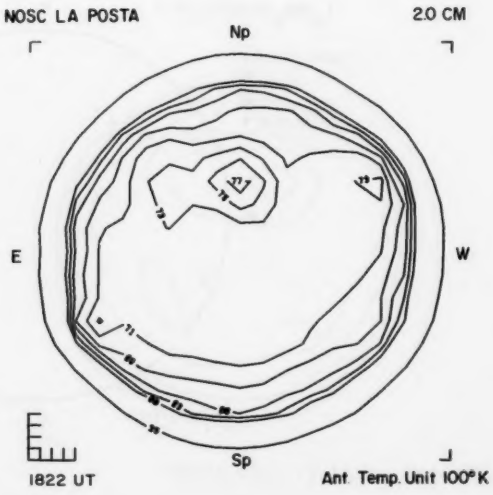
12

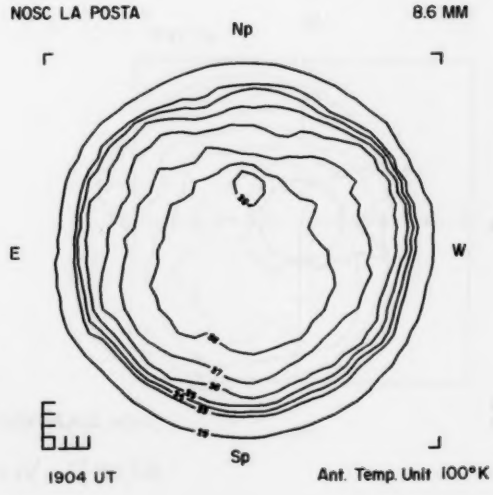

Np
HOLLOMAN
E
W
Sp
1710 UT


Np
Hα
BOULDER
E
W
Sp
NO DATA

Np
SUNSPOTS
E
W
Sp
PROMINENCES
2050 UT


Np
McMATH-HULBERT
CALCIUM REPORT
E
W
Sp
1545 UT
FAIR M
93 - 0900 - 2.5
97 - 1000 - 3.0
100 - 2300 - 3.0
101 - 1100 - 3.0
104 - 0200 - 2.5

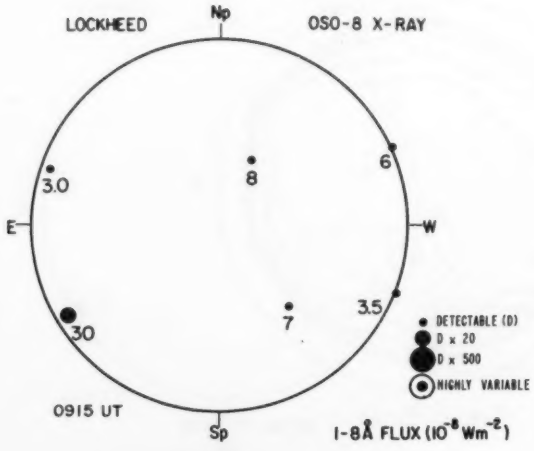

NOSC LA POSTA
2.0 CM
Np
E
W
Sp
1822 UT
Ant. Temp. Unit 100°K


NOSC LA POSTA
8.6 MM
Np
E
W
Sp
1904 UT
Ant. Temp. Unit 100°K

JANUARY 13, 1978 (P =-3.60, B_o =-4.35, L_o =62.29)

LOCKHEED

OSO-8 X-RAY

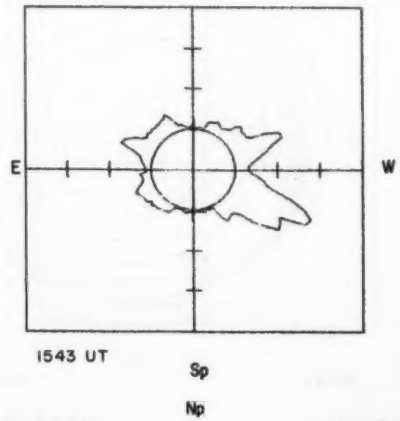


0915 UT

1-8Å FLUX (10^{-8} Wm^{-2})

SACRAMENTO PEAK

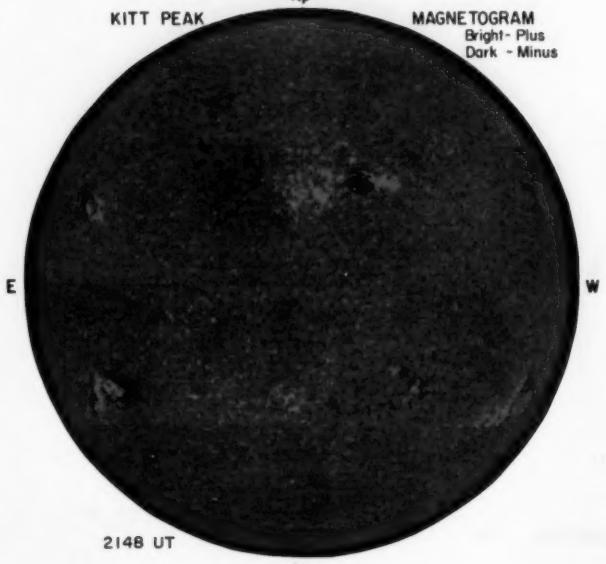
CORONA (1.15 $R_\odot$)
5303 Å



1543 UT

KITT PEAK

MAGNETOGRAM
Bright - Plus
Dark - Minus



2148 UT

MT. WILSON

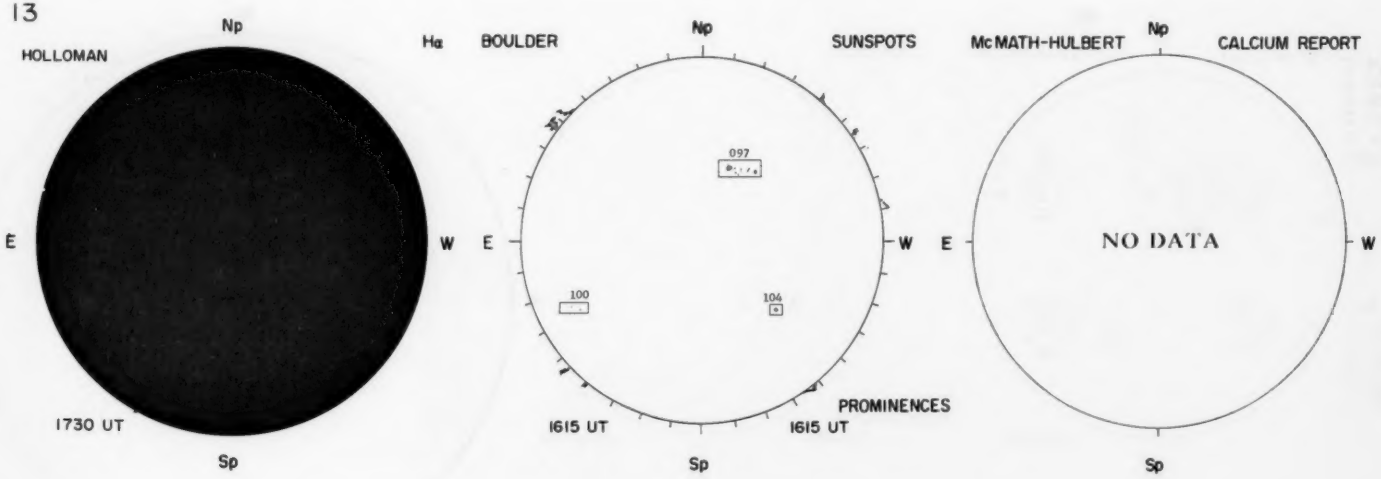
MAGNETOGRAM
Solid - Plus
Dotted - Minus

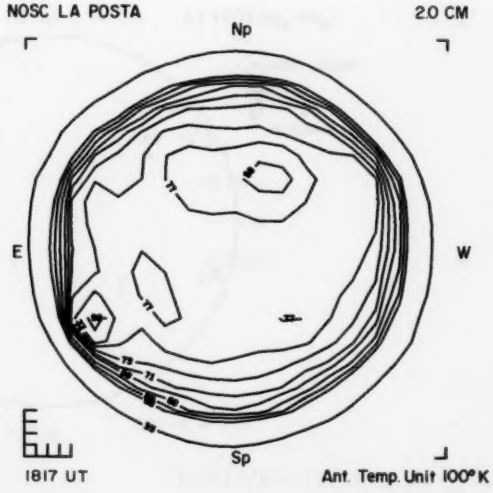
DELTAY =
DELTAX =

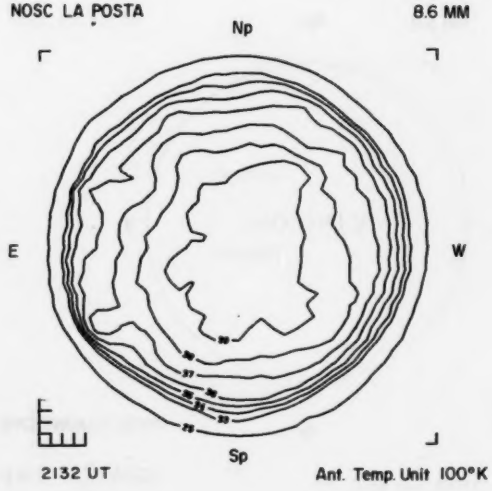
Levels
± 5
± 10
± 20
± 40
± 80

Sp

13

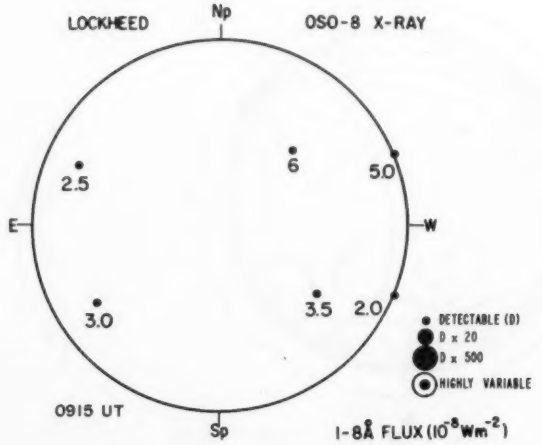

Np
HOLLOMAN
Hα
BOULDER
SUNSPOTS
McMATH-HULBERT
CALCIUM REPORT
E
W
097
100
104
NO DATA
1730 UT
1615 UT
1615 UT
PROMINENCES
Sp


NOSC LA POSTA
2.0 CM
Np
E
W
Sp
1817 UT
Ant. Temp. Unit 100°K


NOSC LA POSTA
8.6 MM
Np
E
W
Sp
2132 UT
Ant. Temp. Unit 100°K

JANUARY 14, 1978 (P =-4.07, B_o =-4.46, L_o =49.13)

LOCKHEED OSO-8 X-RAY

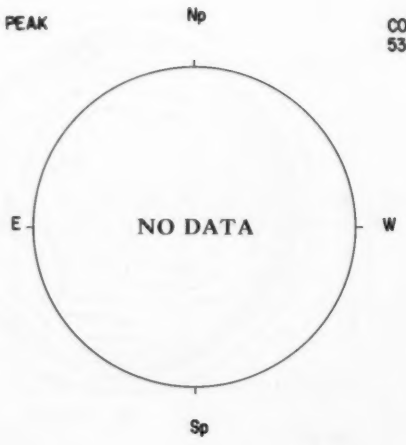


0915 UT

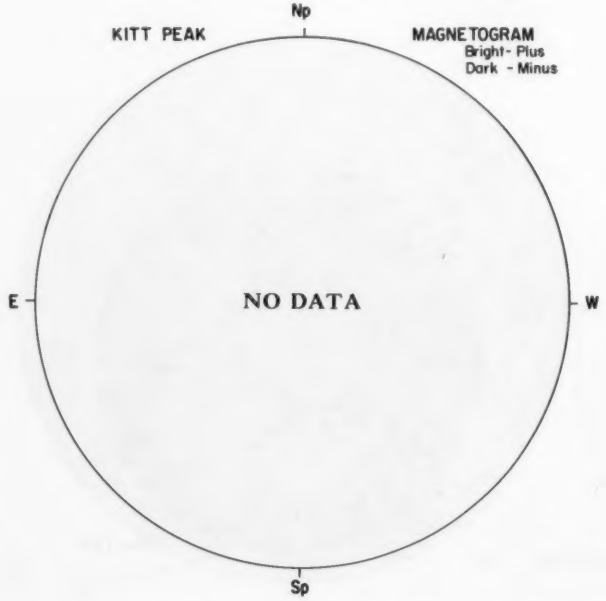
1-8Å FLUX (10^{-8} Wm^{-2})

SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å



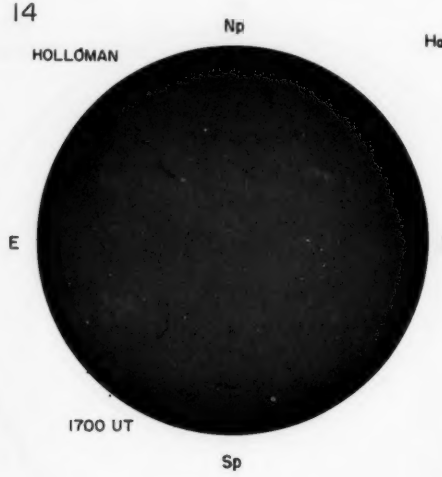
KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus

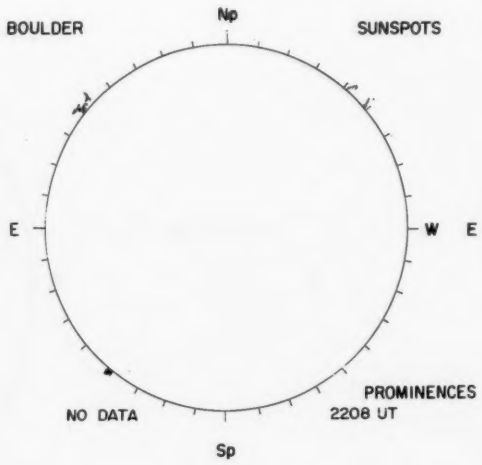


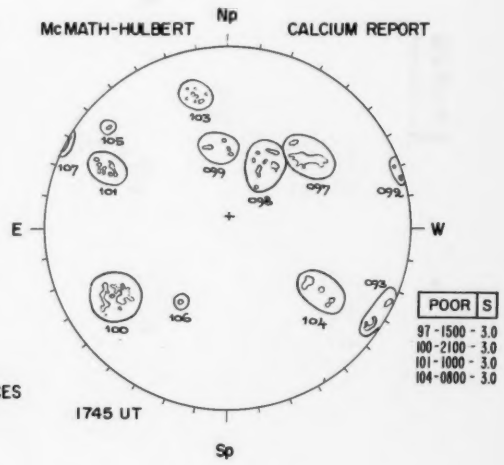
MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus

DELTAY =
DELTAX =

14


Np
HOLLOMAN
E
W
1700 UT
Sp


Hα
BOULDER
Np
SUNSPOTS
E
W
NO DATA
PROMINENCES
2208 UT
Sp


McMATH-HULBERT
Np
CALCIUM REPORT
103
105
107
101
099
098
097
092
093
100
106
104
E
W
1745 UT
Sp
POOR S
97 - 1500 - 3.0
100 - 2100 - 3.0
101 - 1000 - 3.0
104 - 0800 - 3.0

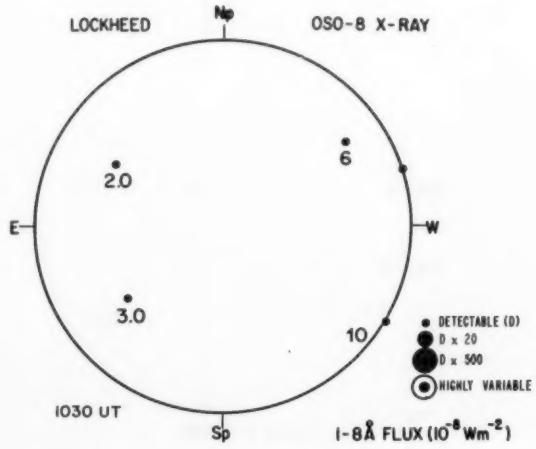
NOSC LA POSTA
Np
2.0 CM
NO DATA
E
WEATHER
W
Sp
---- UT
Ant. Temp. Unit 100°K

NOSC LA POSTA
Np
8.6 MM
NO DATA
E
WEATHER
W
Sp
---- UT
Ant. Temp. Unit 100°K

73
Jan 78

JANUARY 15, 1978 (P =-4.54, B_o =-4.56, L_o =35.96)

LOCKHEED OSO-8 X-RAY

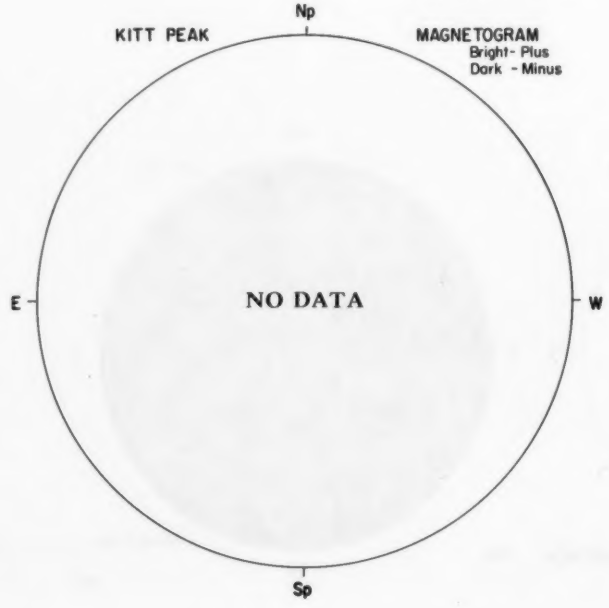


1-8Å FLUX (10^{-8} Wm^{-2})

SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å

KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus



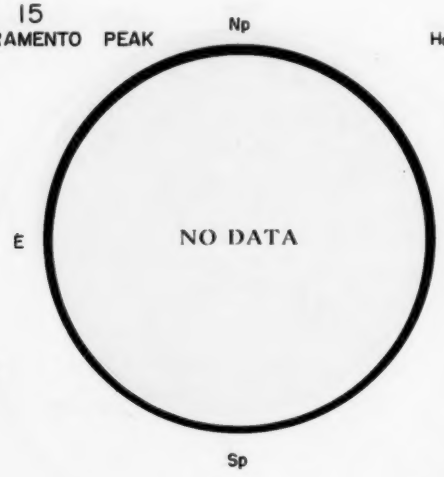
MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus

DELTAY =
DELTAX =

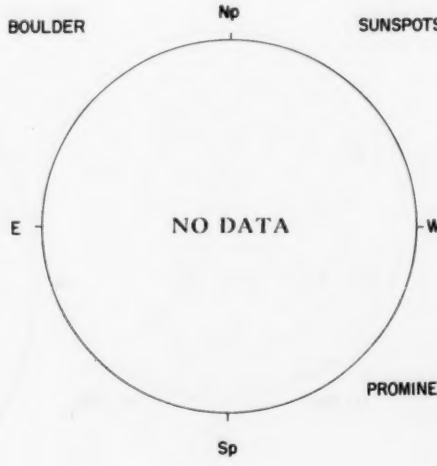
Levels
± 5
± 10
± 20
± 40
± 80

15

SACRAMENTO PEAK



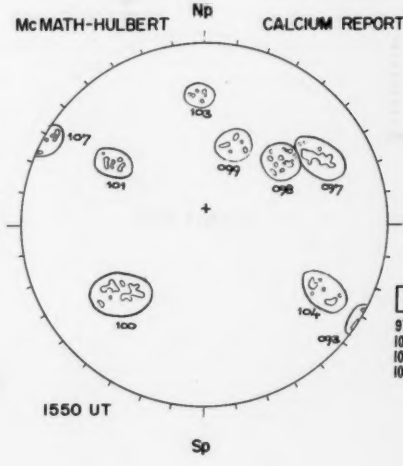
Hα BOULDER



SUNSPOTS

McMATH-HULBERT

CALCIUM REPORT



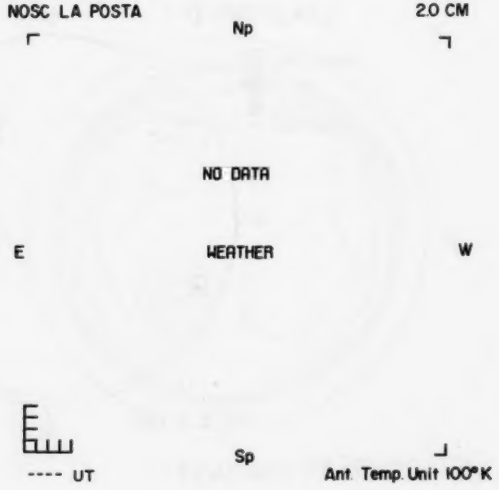
FAIR	S

97 -2000 - 3.0
100 -2100 - 3.0
101 -0800 - 3.0
104 -1300 - 3.0

PROMINENCES

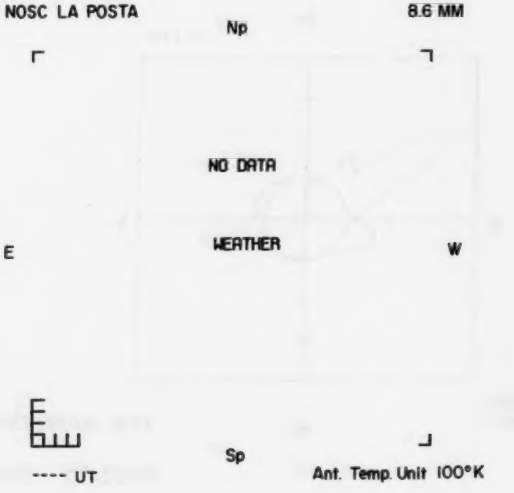
1550 UT

NOSC LA POSTA



2.0 CM

NOSC LA POSTA

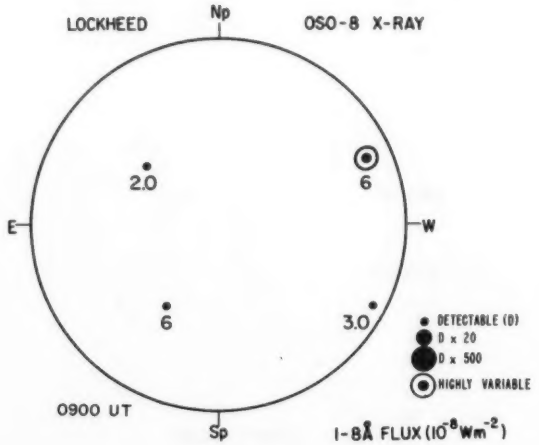


8.6 MM

75
Jan 78

JANUARY 16, 1978 (P =-5.01, B_o =-4.66, L_o =22.79)

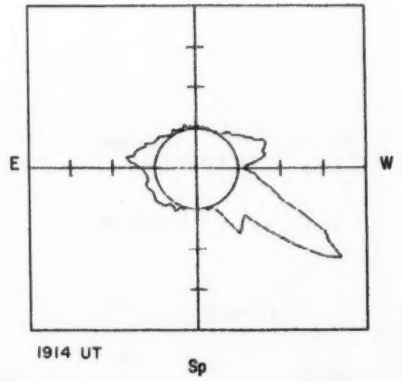
LOCKHEED OSO-8 X-RAY



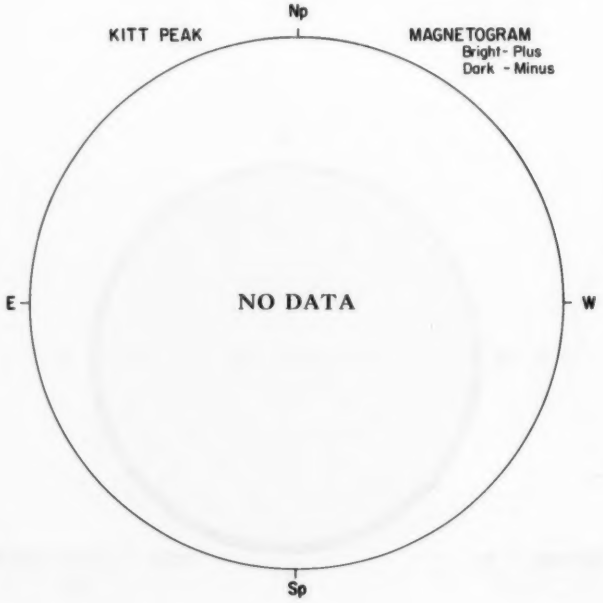
1-8Å FLUX (10^{-8} Wm^{-2})

SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å

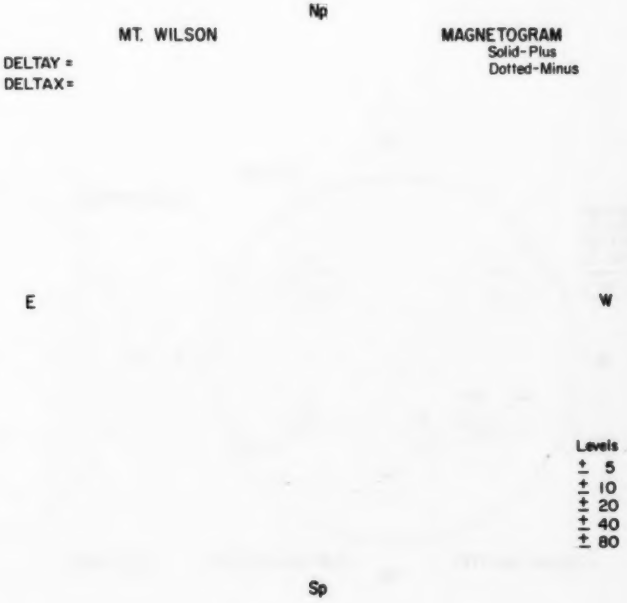


KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus



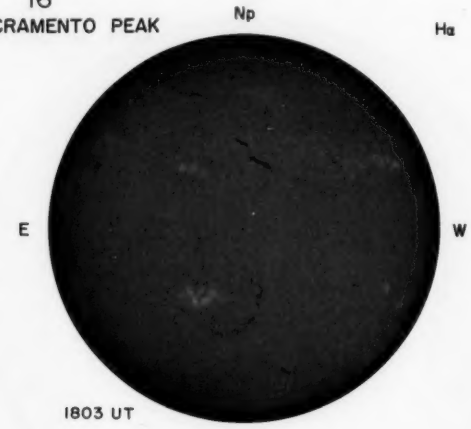
MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus

DELTAY =
DELTAX =



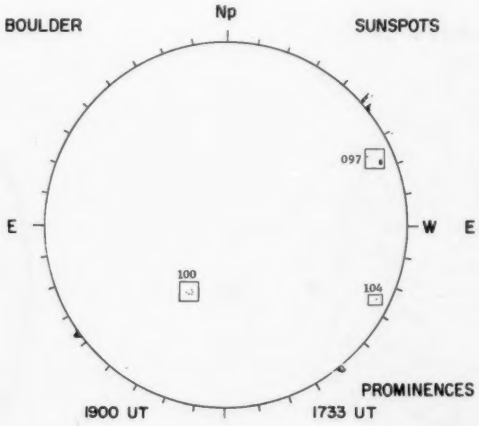
16

SACRAMENTO PEAK



1803 UT

Hα BOULDER



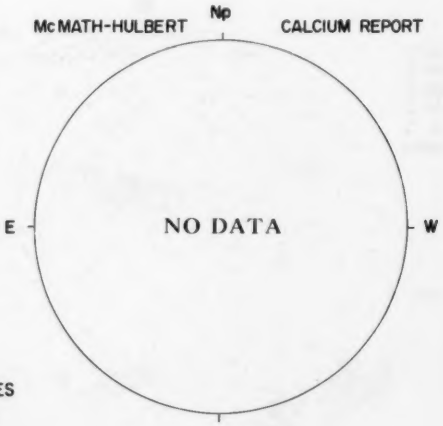
1900 UT

SUNSPOTS

PROMINENCES

1733 UT

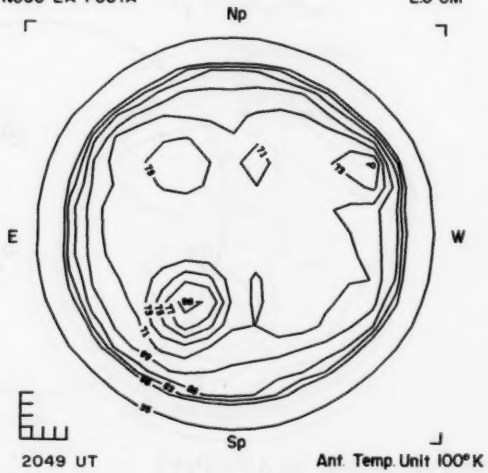
McMATH-HULBERT



CALCIUM REPORT

NOSC LA POSTA

2.0 CM



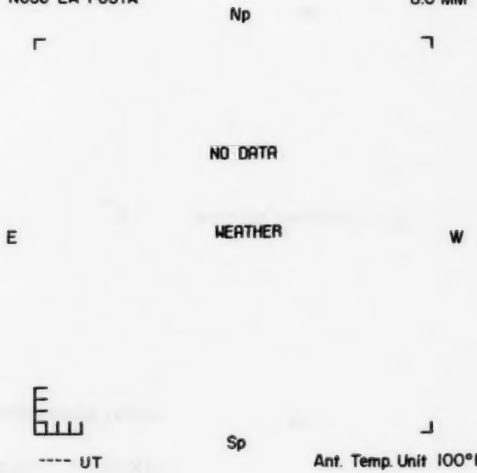
2049 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA

8.6 MM

NO DATA



WEATHER

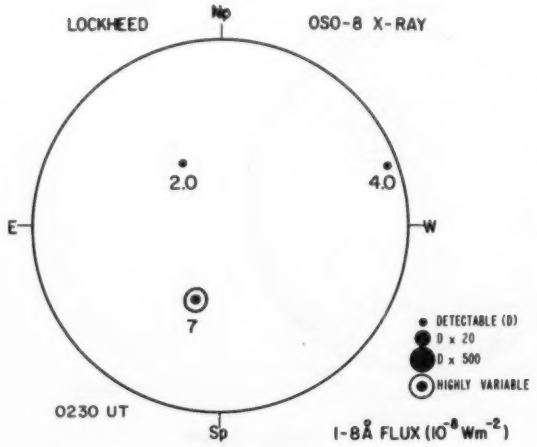
---- UT

Ant. Temp. Unit 100°K

77
Jan 78

JANUARY 17, 1978 (P =-5.48, B_o =-4.76, L_o =9.62)

LOCKHEED OSO-8 X-RAY



0230 UT

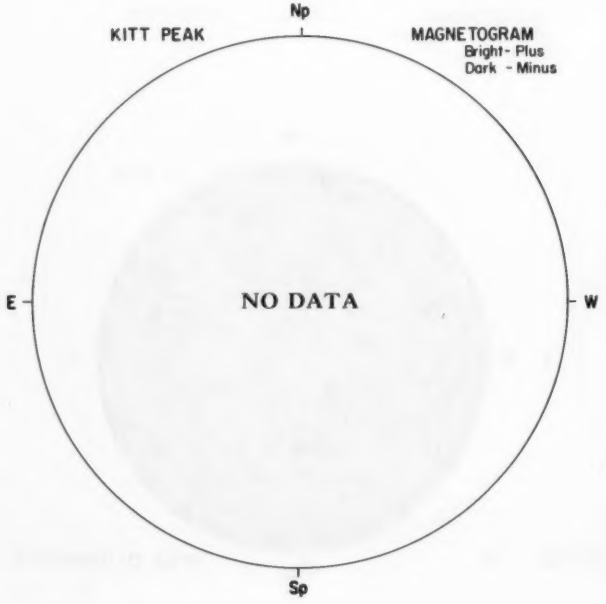
1-8Å FLUX (10^{-8} Wm^{-2})

SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å

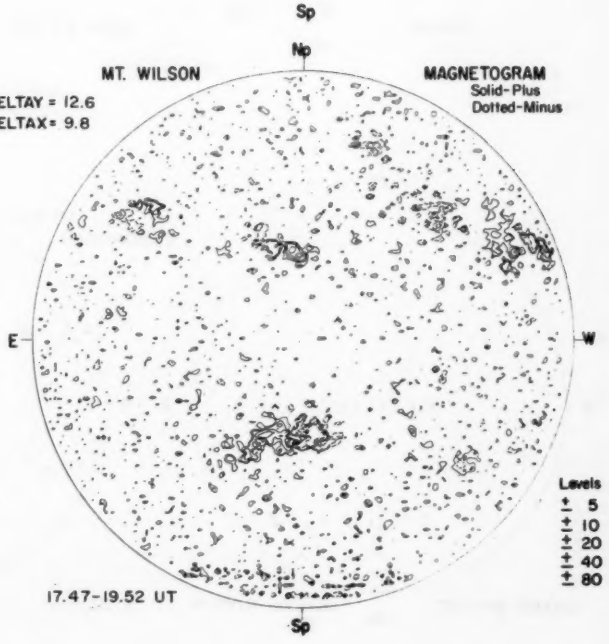
E NO DATA JANUARY 17-25 W

KITT PEAK MAGNETOGRAM
Bright- Plus
Dark - Minus



MT. WILSON MAGNETOGRAM
Solid- Plus
Dotted-Minus

DELTAY = 12.6
DELTAX= 9.8

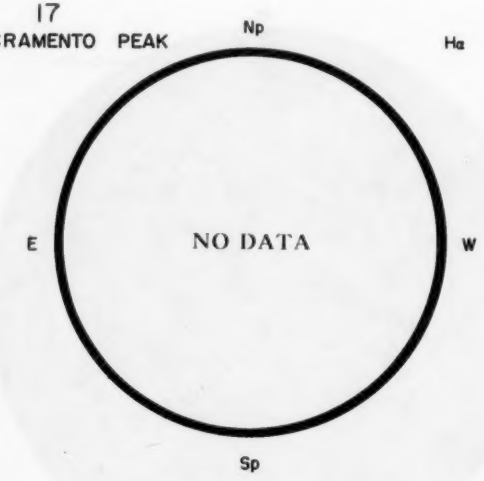


17.47-19.52 UT

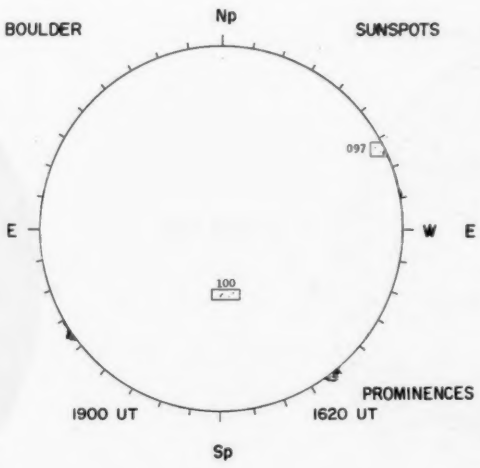
Sp

17

SACRAMENTO PEAK

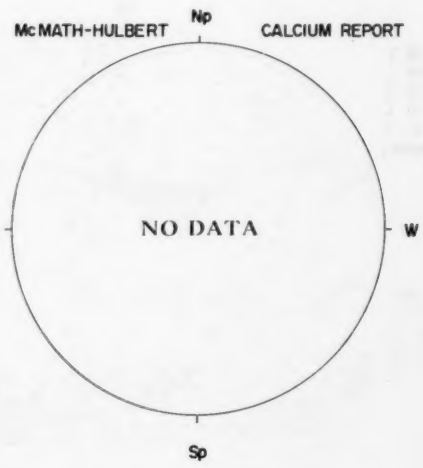


Hα BOULDER



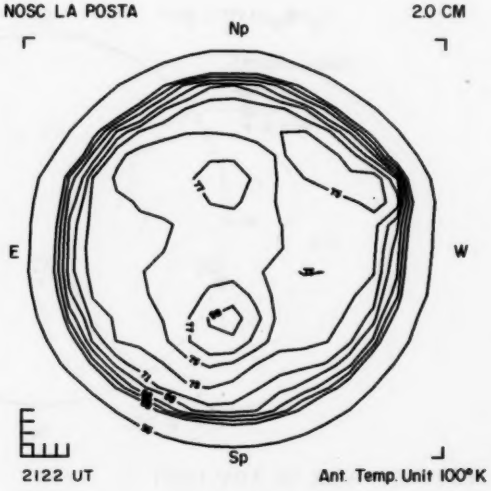
SUNSPOTS

McMATH-HULBERT



CALCIUM REPORT

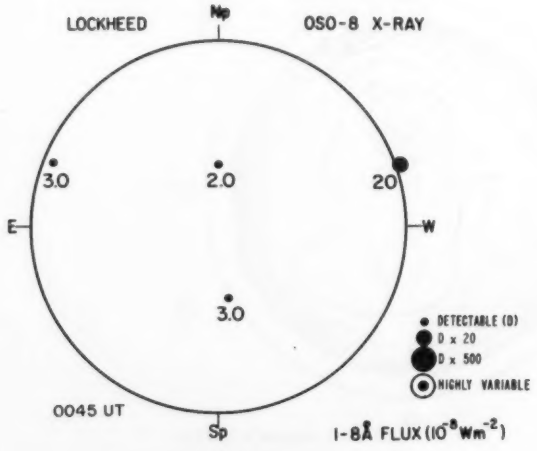
NOSC LA POSTA 2.0 CM



NOSC LA POSTA 8.6 MM

JANUARY 18, 1978 (P =-5.94, B_o =-4.85, L_o =356.46)

LOCKHEED OSO-8 X-RAY

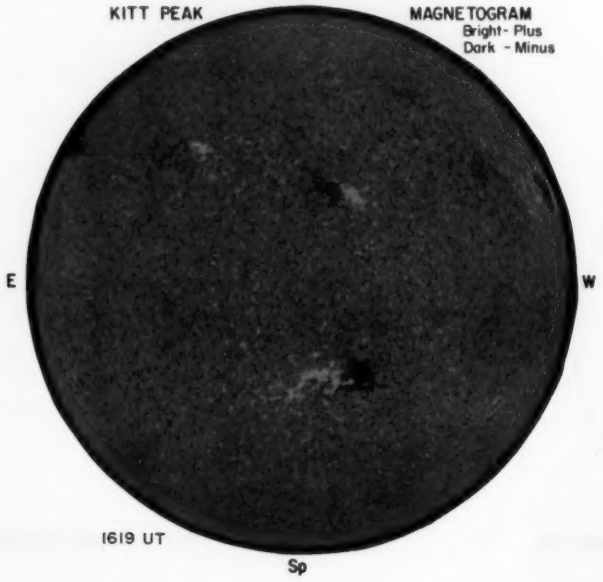


0045 UT

1-8Å FLUX (10^{-8} Wm^{-2})

SACRAMENTO PEAK

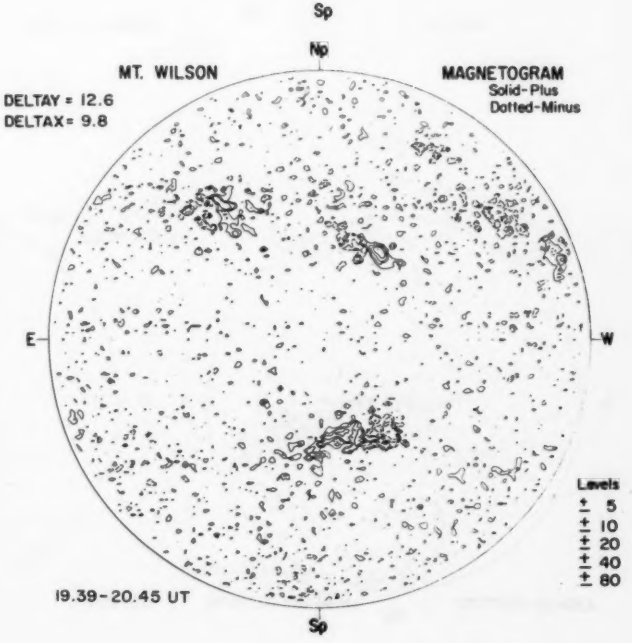
KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus



1619 UT

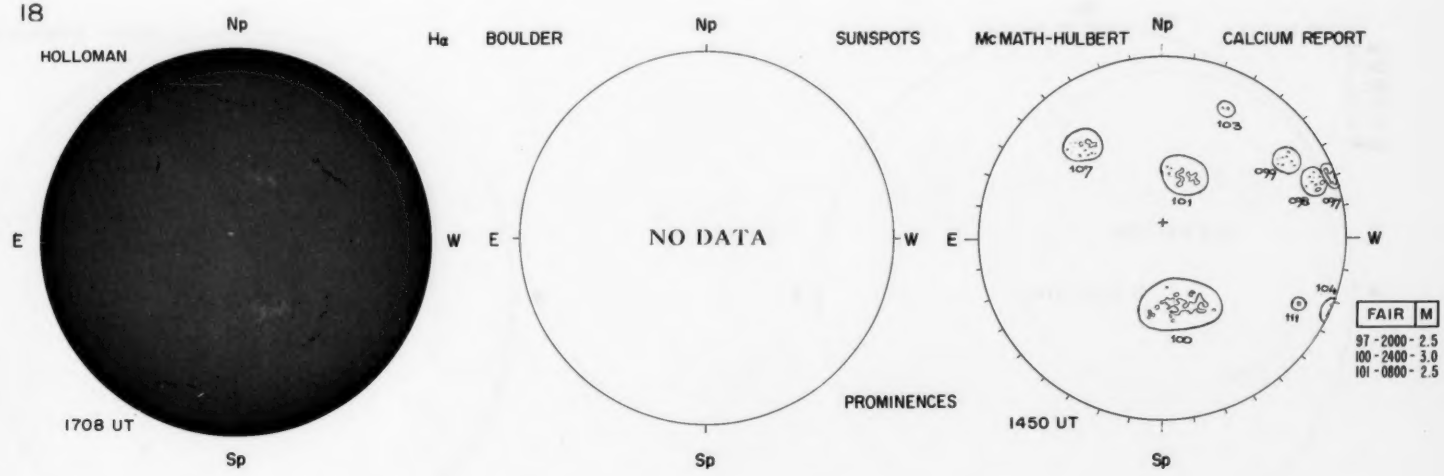
MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus

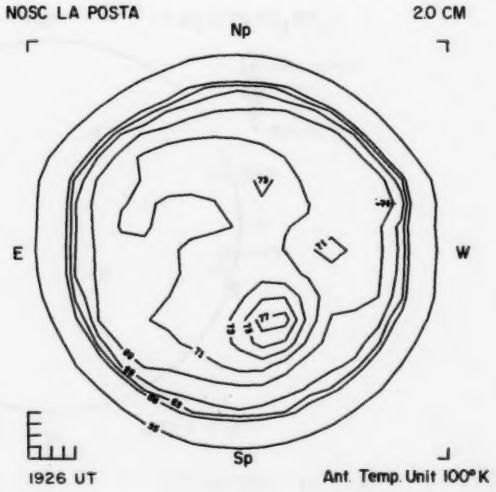
DELTAY = 12.6
DELTAX = 9.8

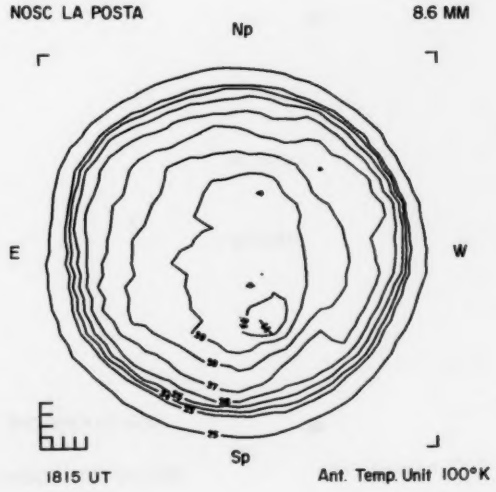


19.39-20.45 UT

18

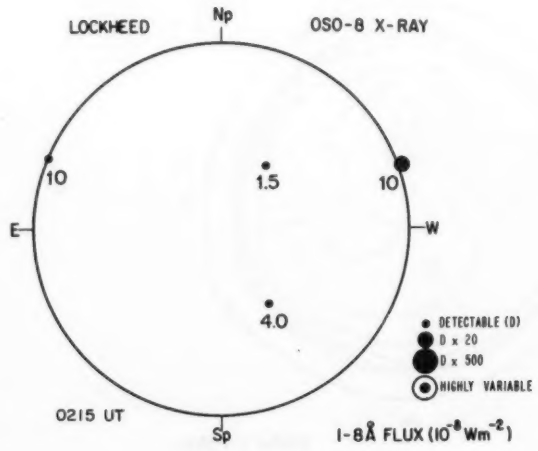

HOLLOMAN
Np
E
W
Sp
1708 UT
Hα
BOULDER
NO DATA
PROMINENCES
SUNSPOTS
McMATH-HULBERT
CALCIUM REPORT
1450 UT
FAIR M
97 - 2000 - 2.5
100 - 2400 - 3.0
101 - 0800 - 2.5


NOSC LA POSTA
2.0 CM
Np
E
W
Sp
1926 UT
Ant. Temp. Unit 100°K


NOSC LA POSTA
8.6 MM
Np
E
W
Sp
1815 UT
Ant. Temp. Unit 100°K

JANUARY 19, 1978 (P =-6.40, B_o =-4.95, L_o =343.29)

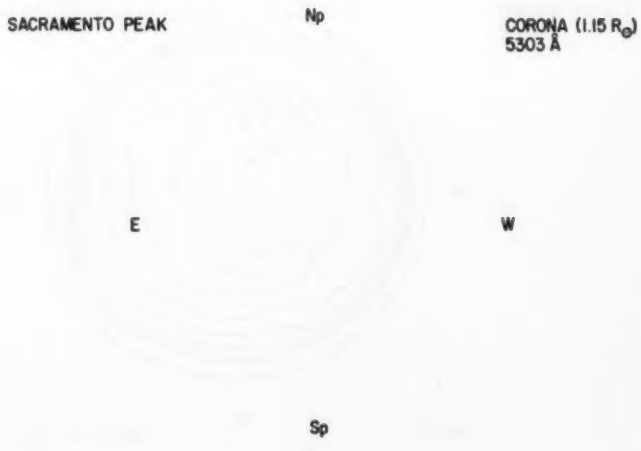
LOCKHEED OSO-8 X-RAY



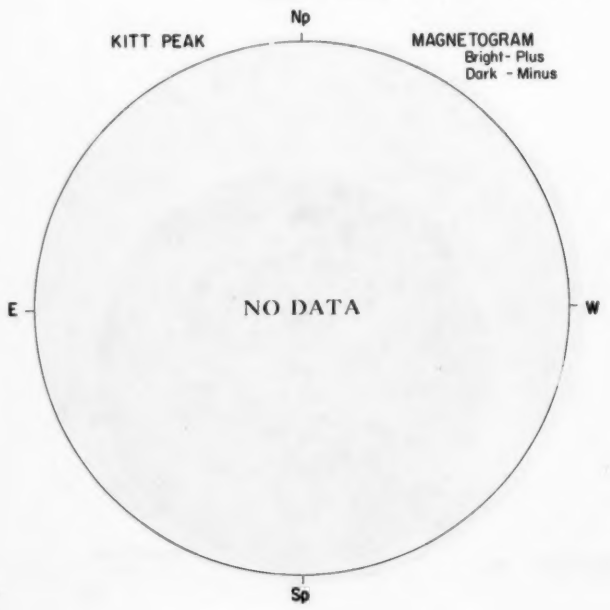
0215 UT

1-8Å FLUX (10^{-8} Wm^{-2})

SACRAMENTO PEAK

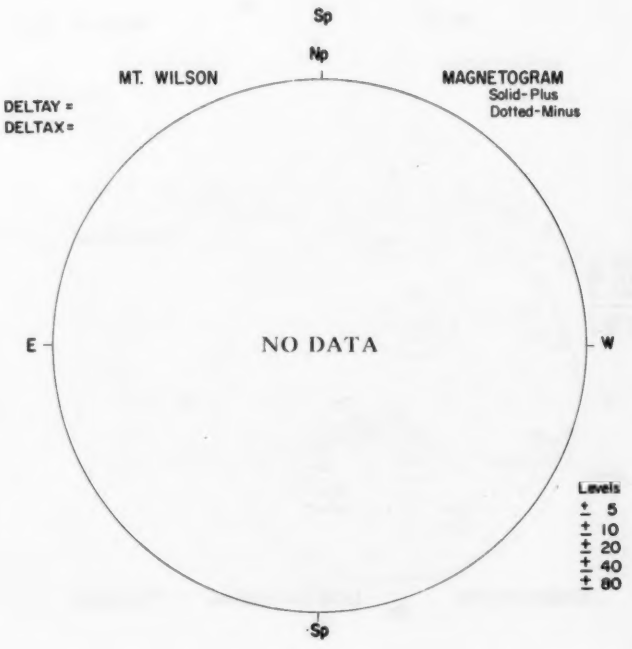


KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus



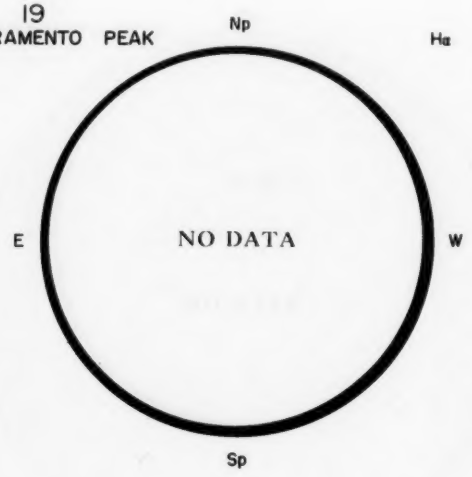
MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus

DELTAY =
DELTAX =

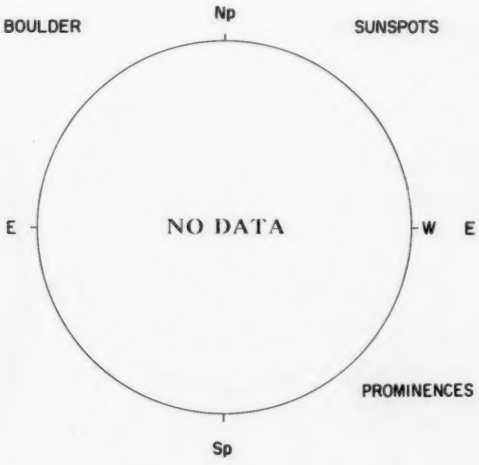


19

SACRAMENTO PEAK



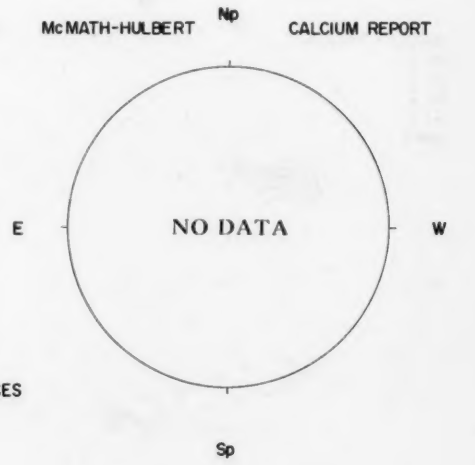
Hα BOULDER



SUNSPOTS

PROMINENCES

McMATH-HULBERT



CALCIUM REPORT

NOSC LA POSTA

Np

2.0 CM

NO DATA

E

WEATHER

W

Sp

Ant. Temp. Unit 100°K

---- UT

NOSC LA POSTA

Np

8.6 MM

NO DATA

E

WEATHER

W

Sp

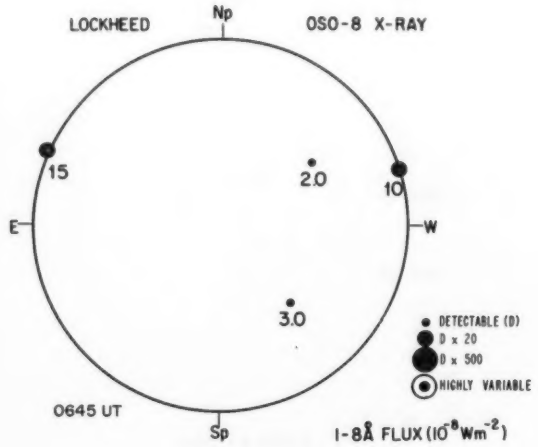
Ant. Temp. Unit 100°K

---- UT

83
Jan 78

JANUARY 20, 1978 (P =-6.86, B_o =-5.04, L_o =330.12)

LOCKHEED OSO-8 X-RAY



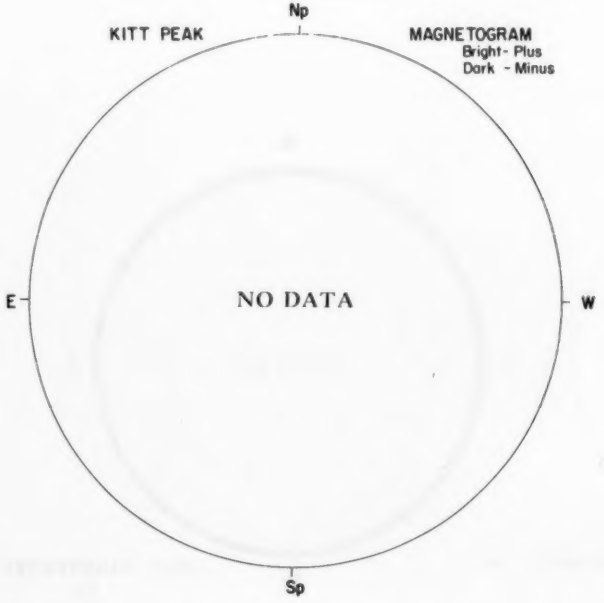
0645 UT

1-8Å FLUX ($10^{-8}Wm^{-2}$)

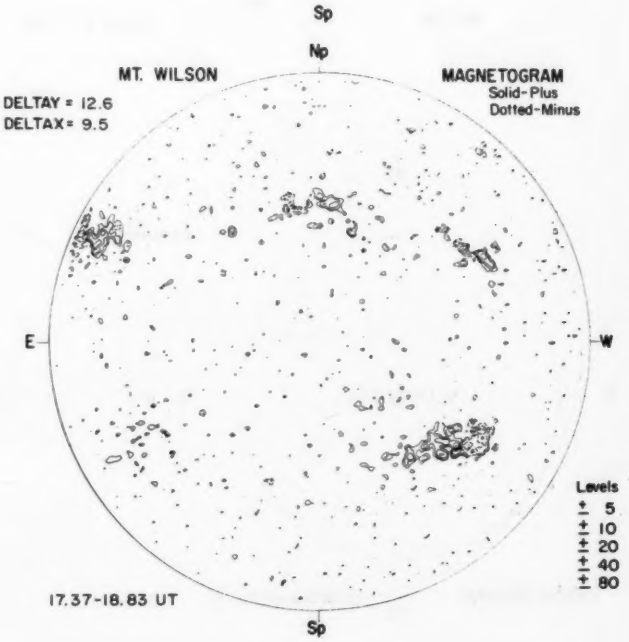
SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å

KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus



MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus
DELTAY = 12.6
DELTAX = 9.5



17.37-18.83 UT

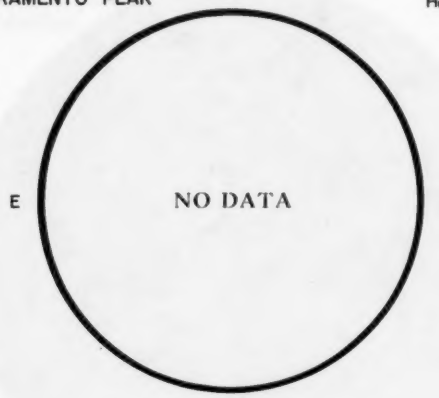
Sp

Sp

20

SACRAMENTO PEAK

Np



Sp

Hα BOULDER

Np

Sp

SUNSPOTS

PROMINENCES

McMATH-HULBERT

Np

Sp

CALCIUM REPORT

NOSC LA POSTA

Np

20 CM

NOSC LA POSTA

Np

8.6 MM

NO DATA

E

WEATHER

W

NO DATA

E

EQUIPMENT

W

---- UT

Sp

Ant. Temp. Unit 100°K

---- UT

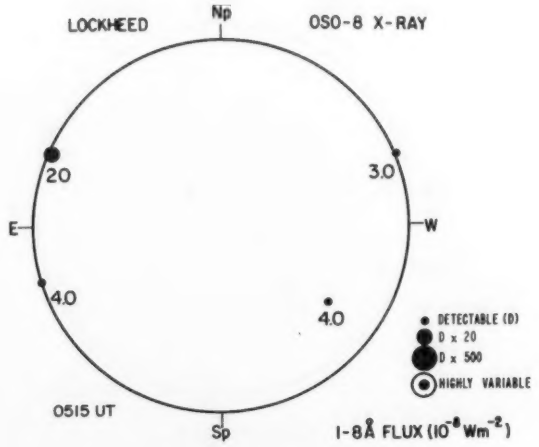
Sp

Ant. Temp. Unit 100°K

85
Jan 78

JANUARY 21, 1978 (P =-7.31, B_o =-5.13, L_o =316.95)

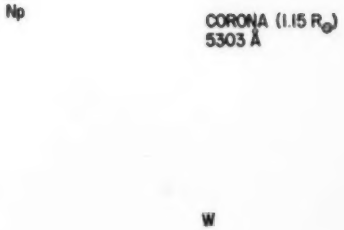
LOCKHEED OSO-8 X-RAY



0515 UT

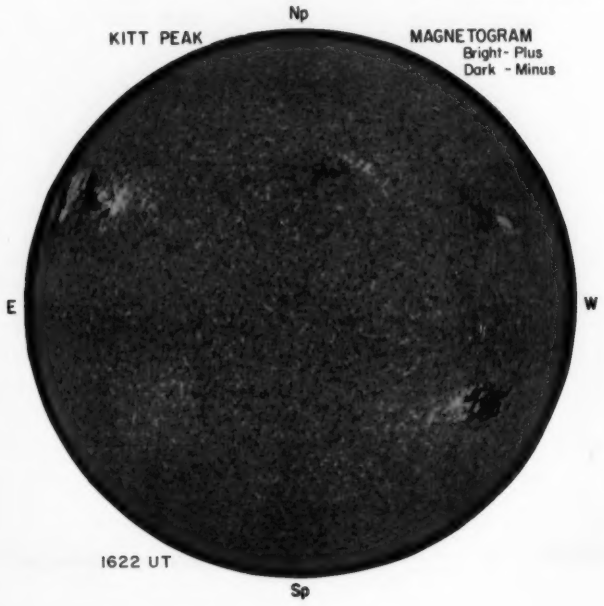
1-8Å FLUX (10^{-8} Wm^{-2})

SACRAMENTO PEAK



CORONA (1.15 $R_\odot$)
5303 Å

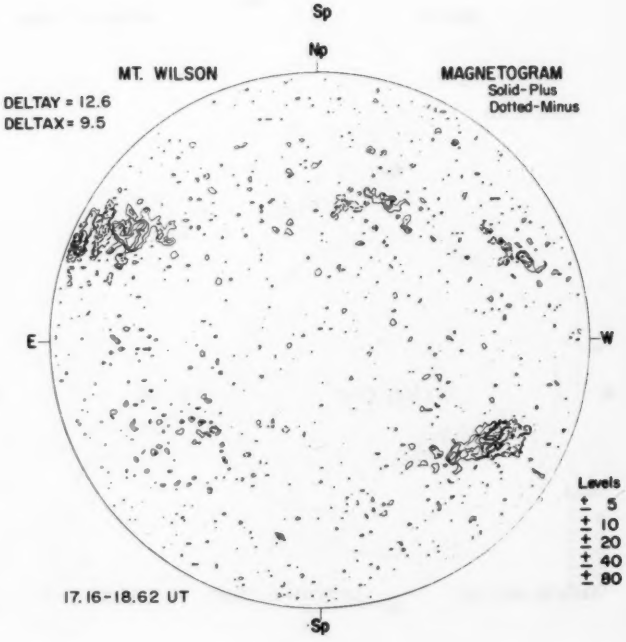
KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus



1622 UT

MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus

DELTAY = 12.6
DELTAX = 9.5

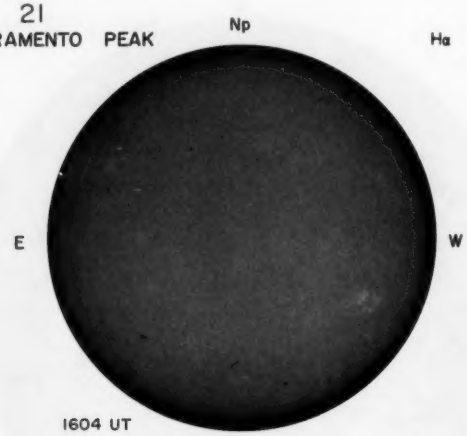


17.16-18.62 UT

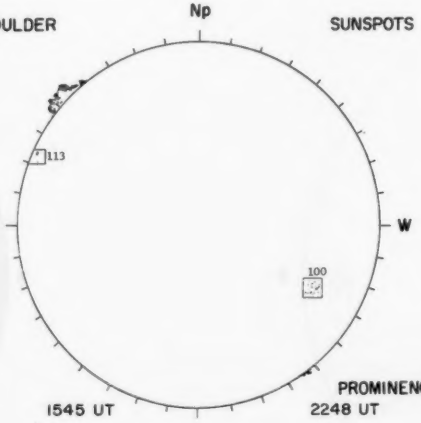
Sp

21

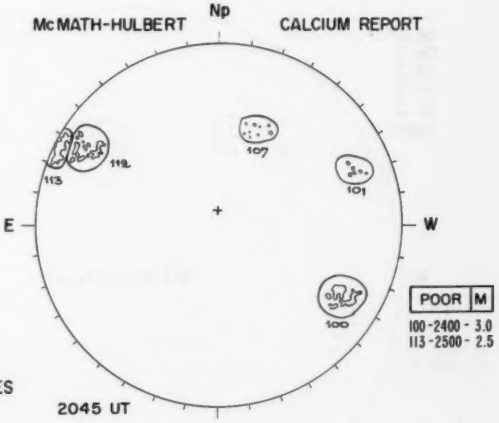
SACRAMENTO PEAK



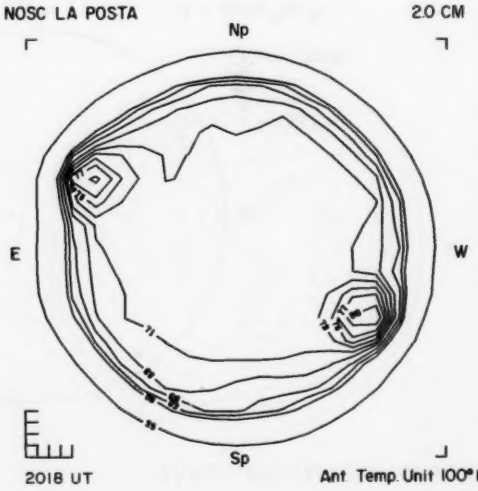
BOULDER



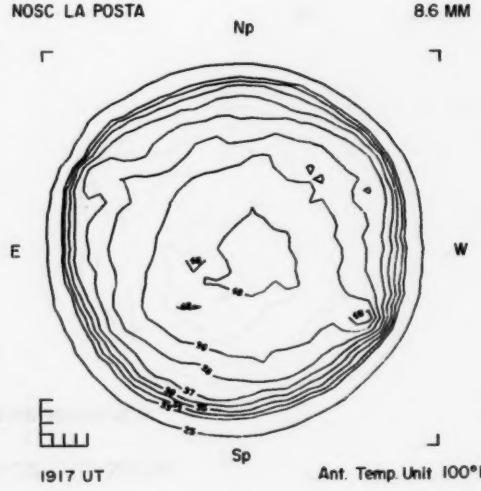
McMATH-HULBERT



NOSC LA POSTA

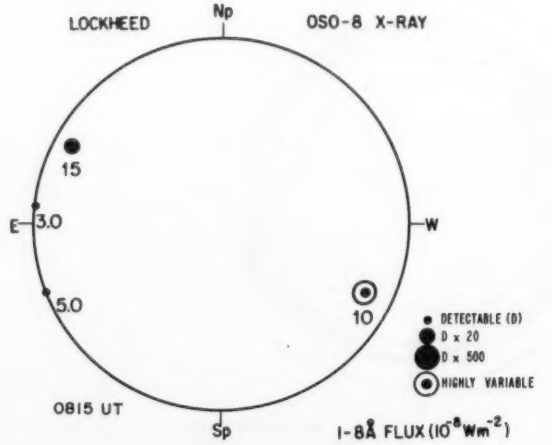


NOSC LA POSTA



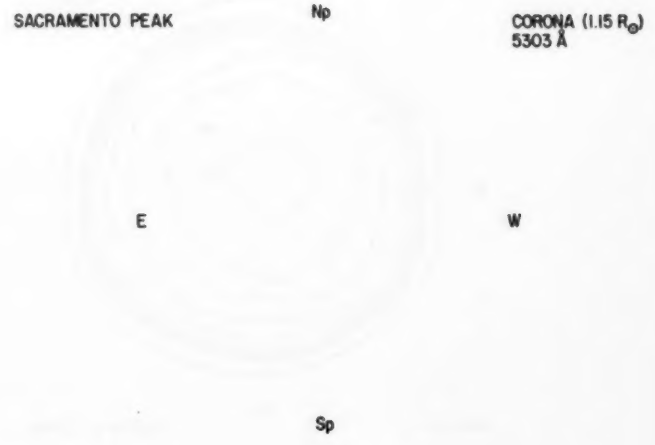
JANUARY 22, 1978 (P =-7.77, B_o =-5.22, L_o =303.79)

LOCKHEED OSO-8 X-RAY

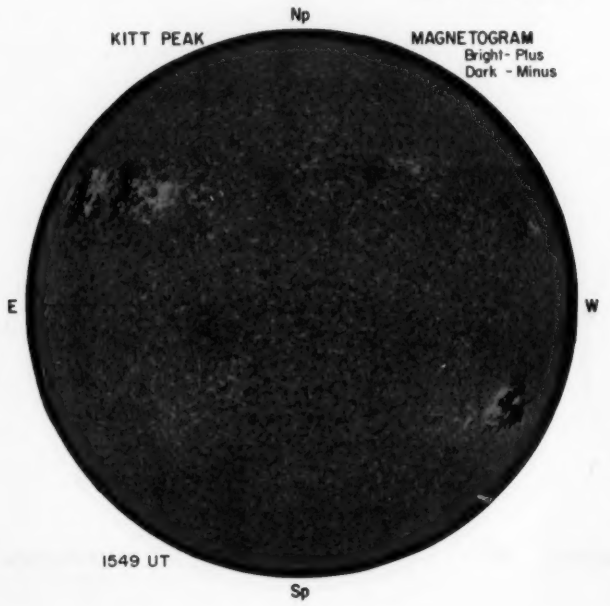


1-8Å FLUX (10^{-8} Wm^{-2})

SACRAMENTO PEAK

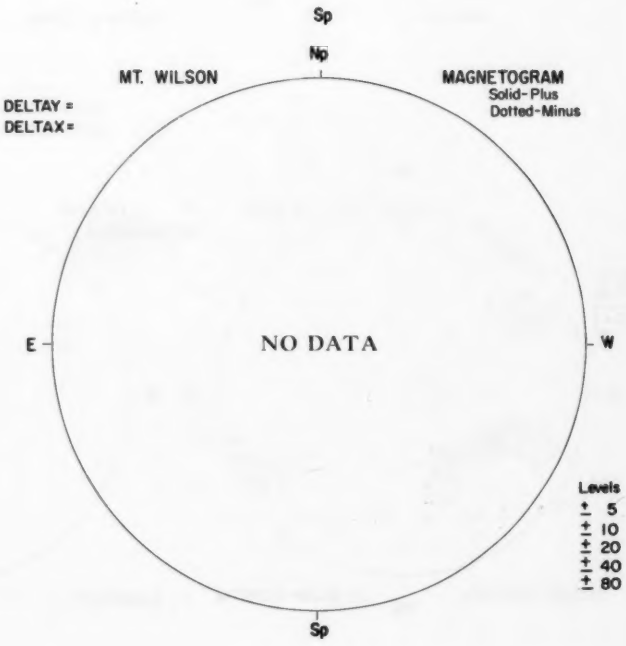


KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus



MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus

DELTAY =
DELTAX =

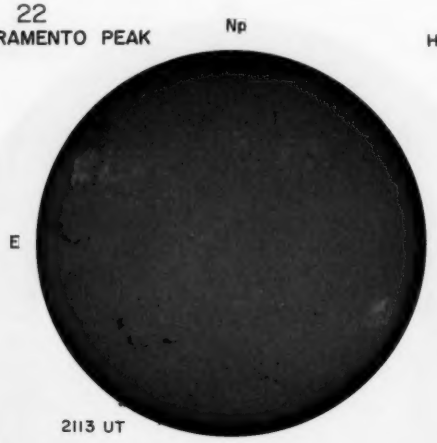


Sp

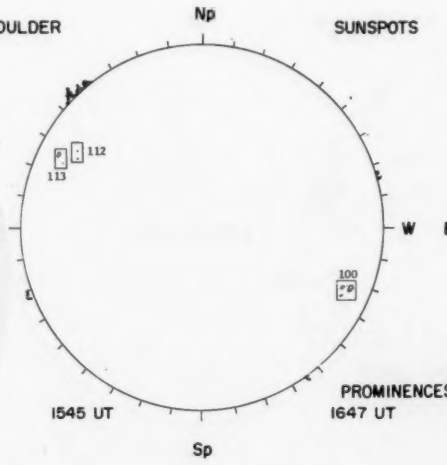
Sp

22

SACRAMENTO PEAK



Hα BOULDER

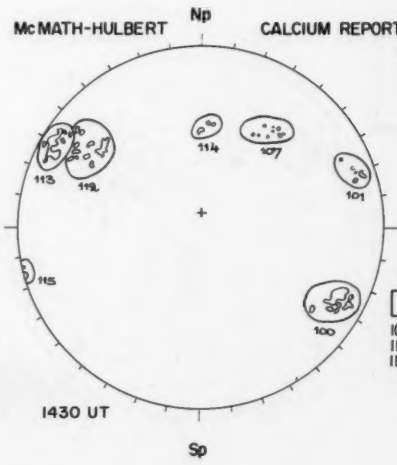


SUNSPOTS

PROMINENCES

1647 UT

McMATH-HULBERT

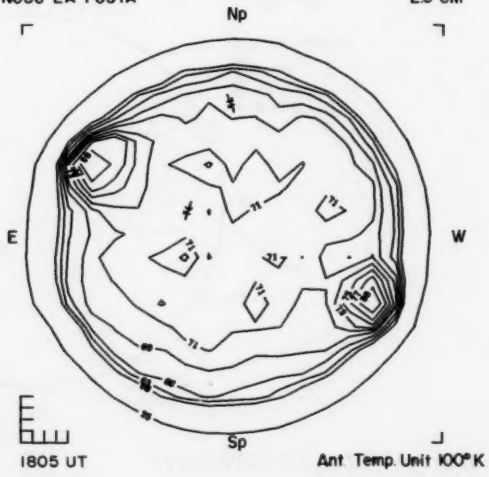


CALCIUM REPORT

FAIR	D

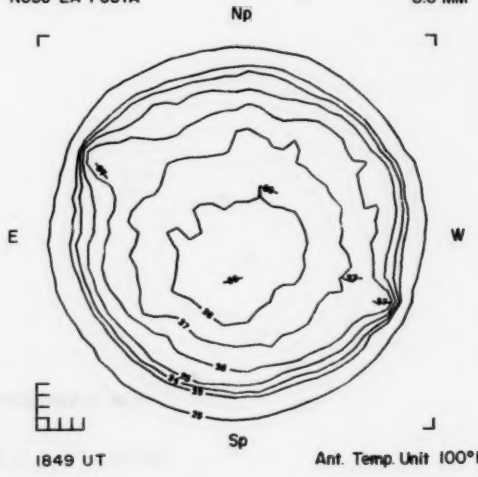
100 - 2400 - 3.5
112 - 1800 - 3.0
113 - 2600 - 3.5

NOSC LA POSTA 2.0 CM



Ant. Temp. Unit 100°K

NOSC LA POSTA 8.6 MM

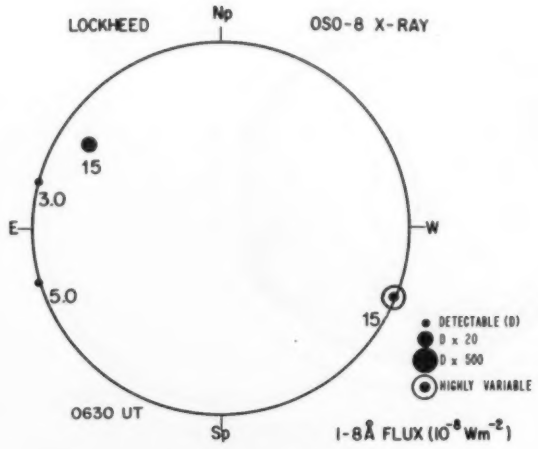


Ant. Temp. Unit 100°K

89
Jan 78

JANUARY 23, 1978 (P =-8.21, B_0 =-5.31, L_0 =290.62)

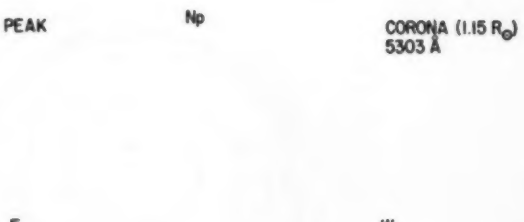
LOCKHEED OSO-8 X-RAY



0630 UT

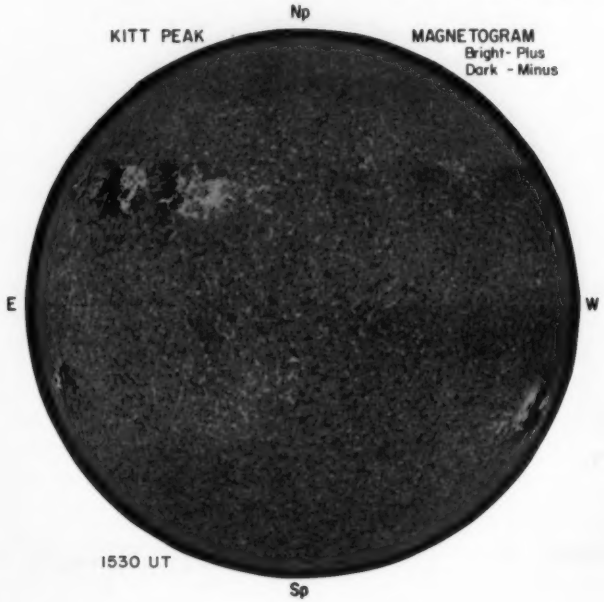
1-8Å FLUX (10^{-8} Wm^{-2})

SACRAMENTO PEAK



CORONA (1.15 $R_\odot$)
5303 Å

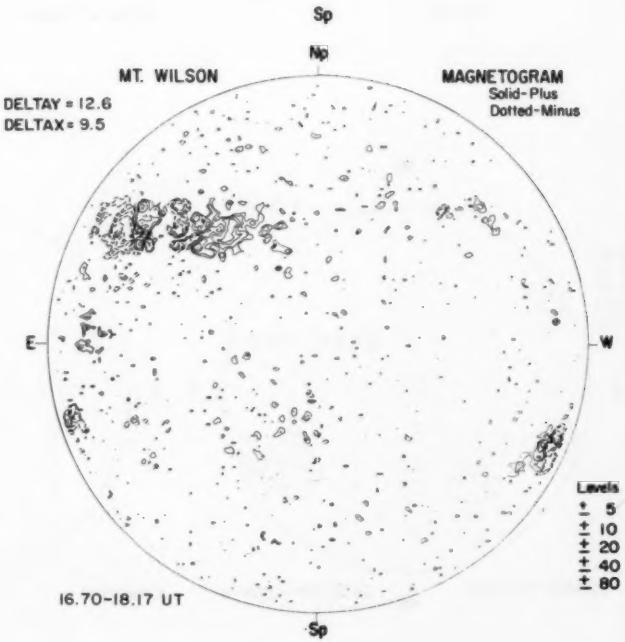
KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus



1530 UT

MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus

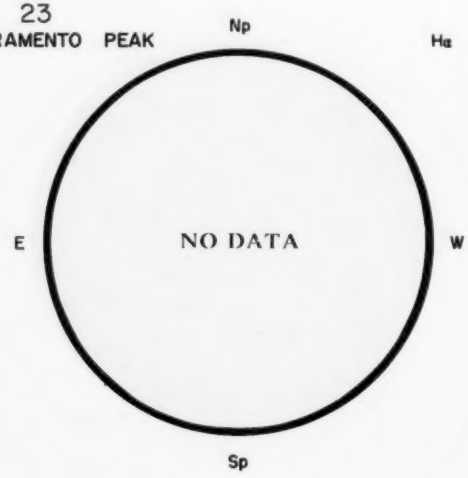
DELTAY = 12.6
DELTAX = 9.5



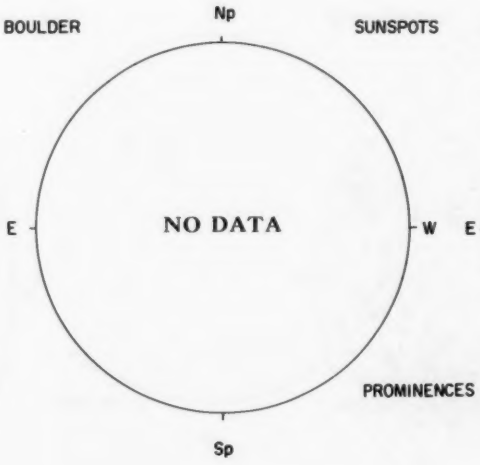
16.70-18.17 UT

23

SACRAMENTO PEAK

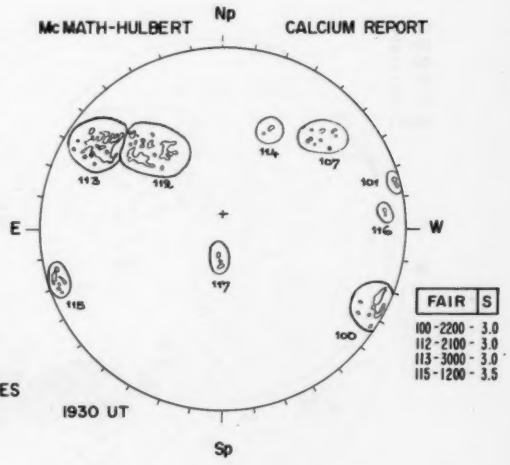


Hα BOULDER



SUNSPOTS

McMATH-HULBERT



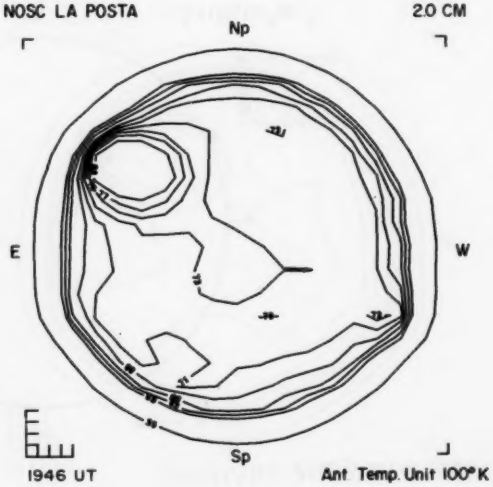
1930 UT

CALCIUM REPORT

FAIR	S
100-2200	3.0
112-2100	3.0
113-3000	3.0
115-1200	3.5

PROMINENCES

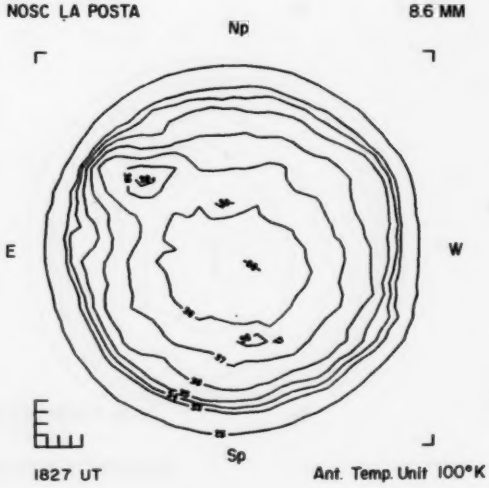
NOSC LA POSTA 20 CM



1946 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA 8.6 MM

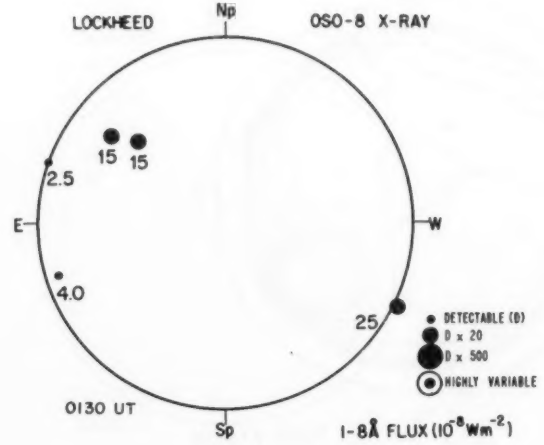


1827 UT

Ant. Temp. Unit 100°K

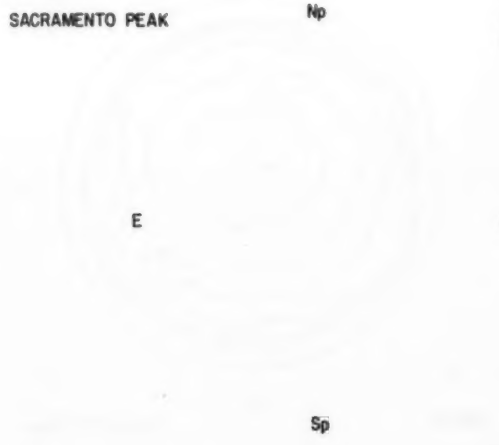
JANUARY 24, 1978 (P =-8.66, B_o =-5.40, L_o =277.45)

LOCKHEED OSO-8 X-RAY

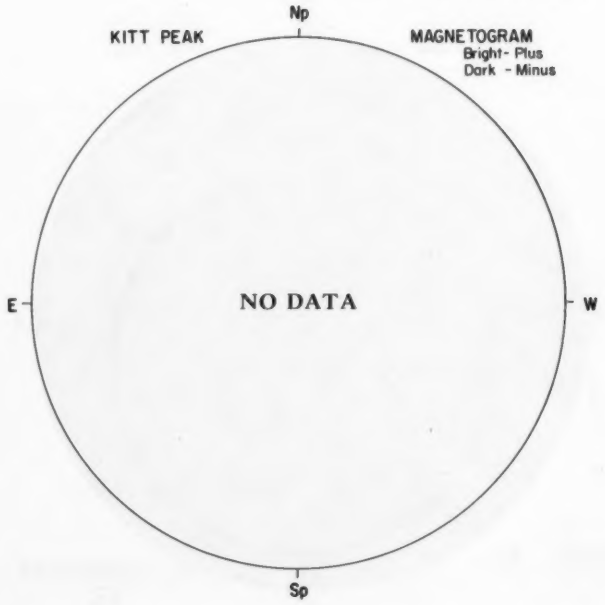


1-8Å FLUX (10^{-8} Wm^{-2})

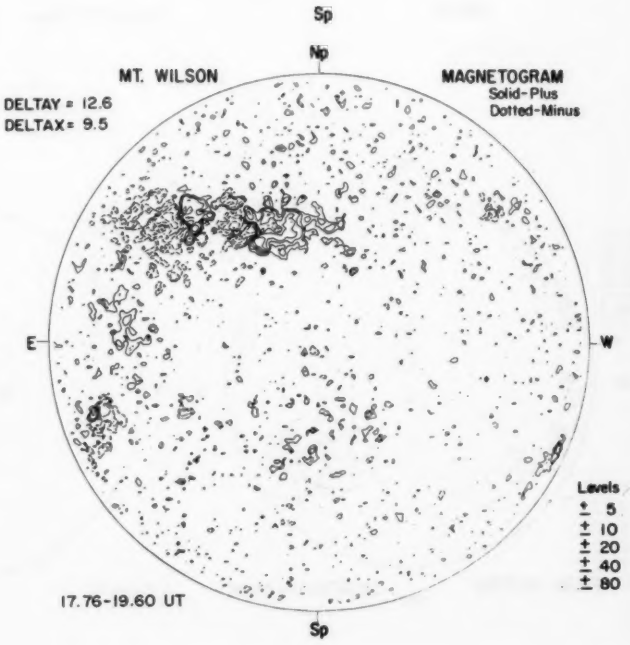
SACRAMENTO PEAK

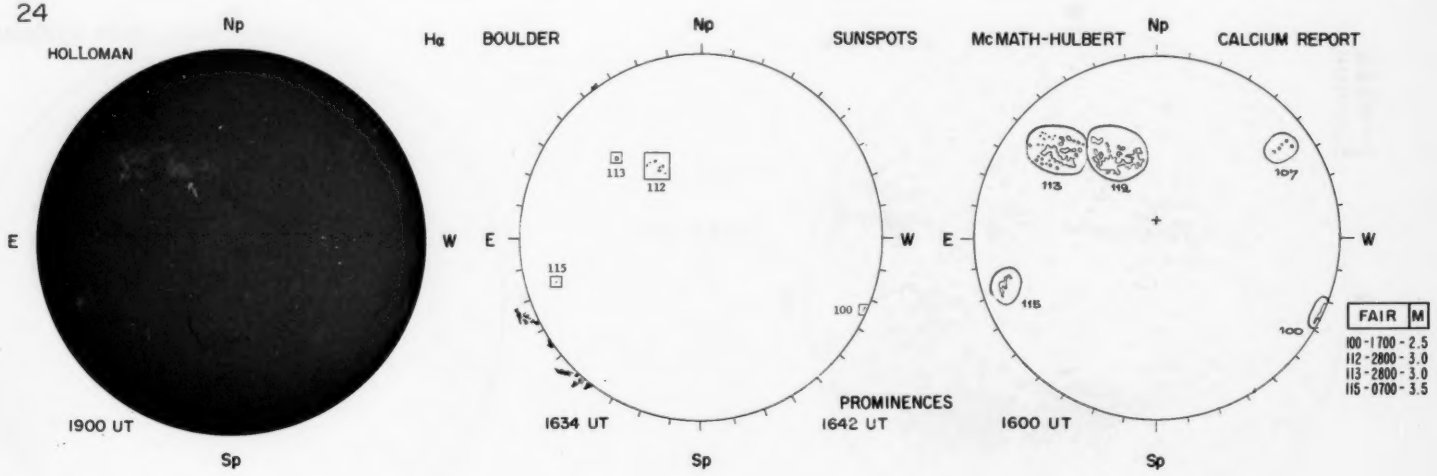


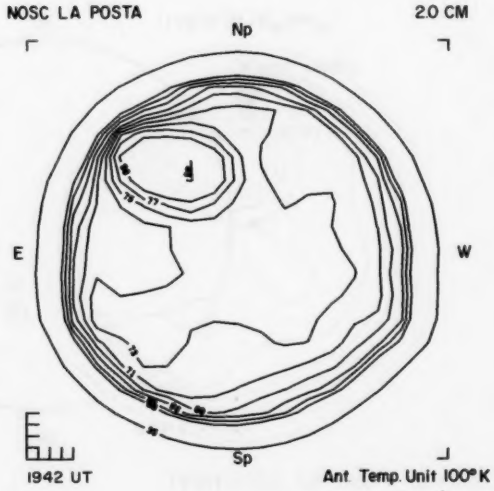
KITT PEAK MAGNETOGRAM
Bright- Plus
Dark - Minus

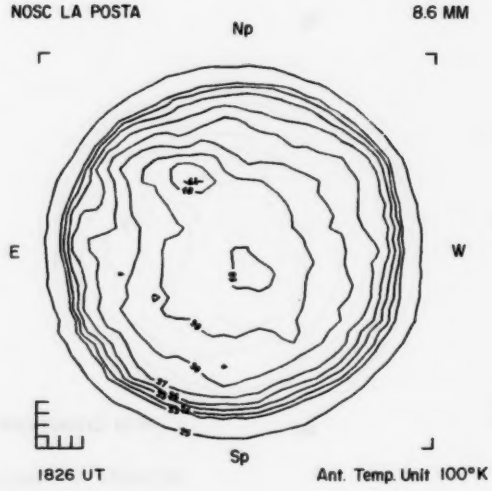


MT. WILSON MAGNETOGRAM
Solid-Plus
Dotted-Minus
DELTAY = 12.6
DELTAX = 9.5



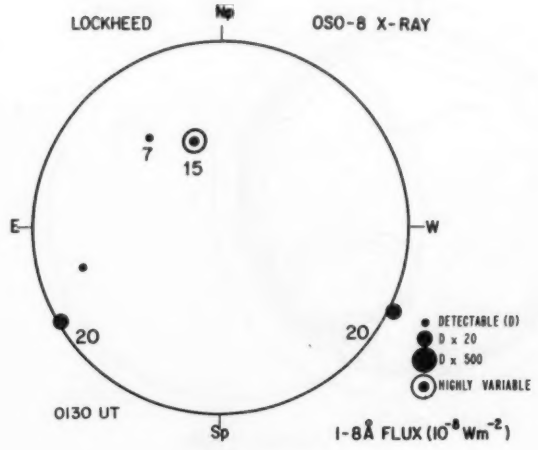

HOLLOMAN
Np
E
W
Sp
1900 UT
Hα
BOULDER
113
112
115
100
1634 UT
SUNSPOTS
PROMINENCES
1642 UT
McMATH-HULBERT
CALCIUM REPORT
113
112
107
115
100
1600 UT
FAIR M
100 - 1700 - 2.5
112 - 2800 - 3.0
113 - 2800 - 3.0
115 - 0700 - 3.5


NOSC LA POSTA
2.0 CM
Np
E
W
Sp
1942 UT
Ant. Temp. Unit 100°K


NOSC LA POSTA
8.6 MM
Np
E
W
Sp
1826 UT
Ant. Temp. Unit 100°K

JANUARY 25, 1978 (P =-9.10, B_o =-5.48, L_o =264.29)

LOCKHEED OSO-8 X-RAY

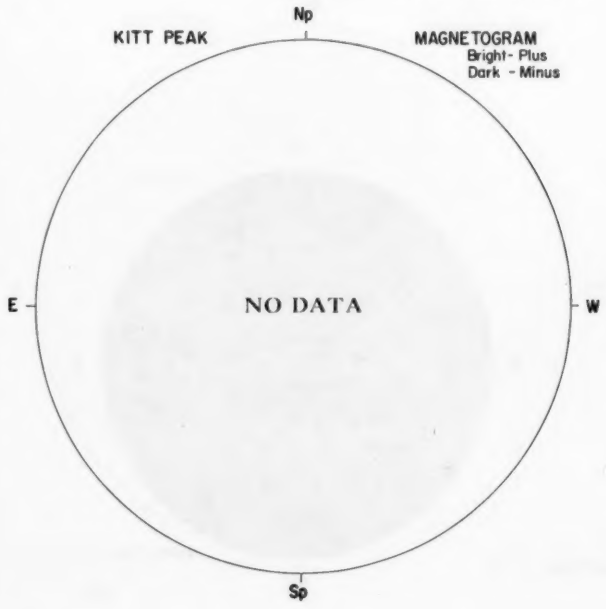


0130 UT

1-8Å FLUX (10^{-8} Wm^{-2})

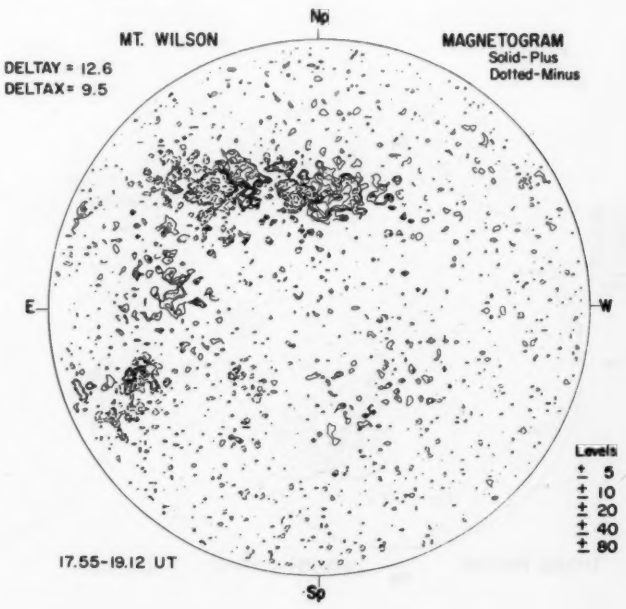
SACRAMENTO PEAK

KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus



MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus

DELTAY = 12.6
DELTAX = 9.5

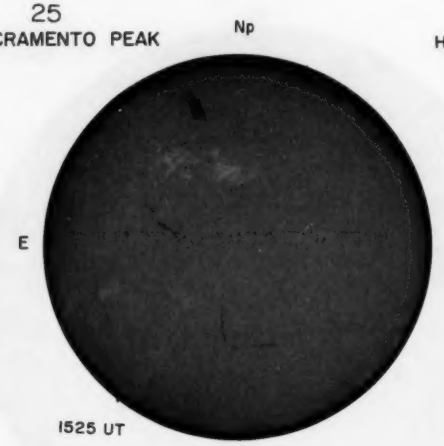


17.55-19.12 UT

Sp

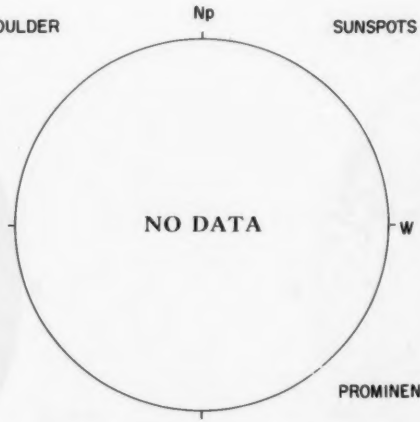
25

SACRAMENTO PEAK



1525 UT

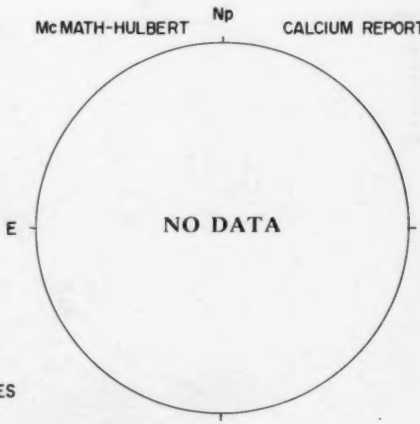
Hα BOULDER



SUNSPOTS

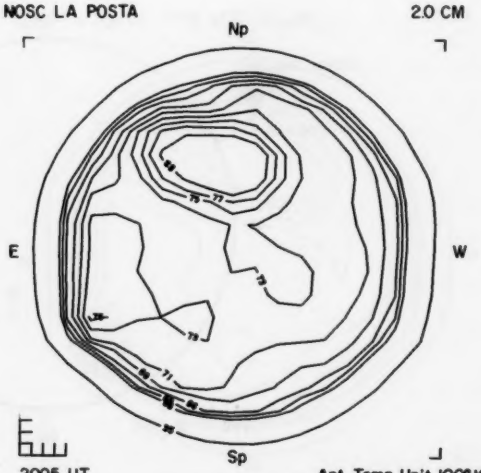
PROMINENCES

McMATH-HULBERT



CALCIUM REPORT

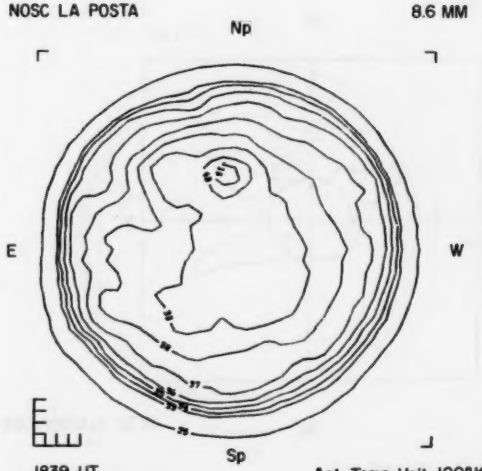
NOSC LA POSTA 2.0 CM



2005 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA 8.6 MM

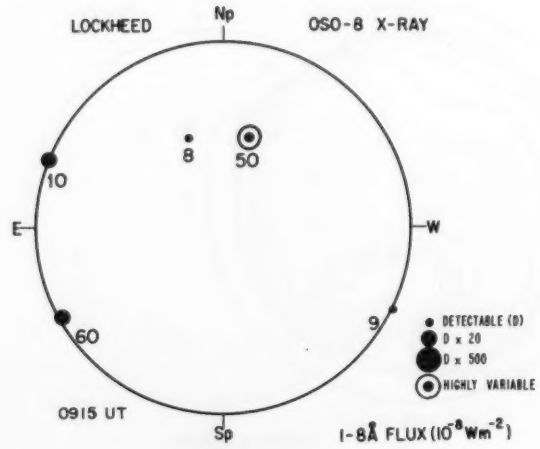


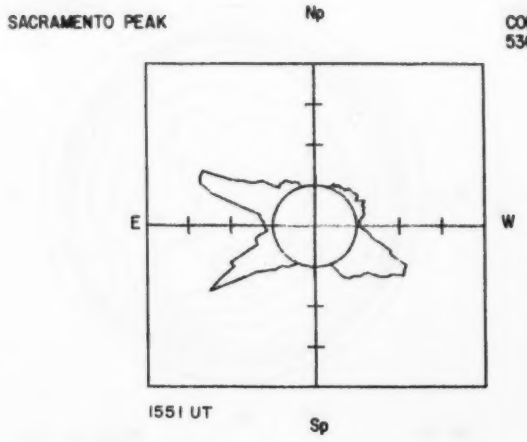
1839 UT

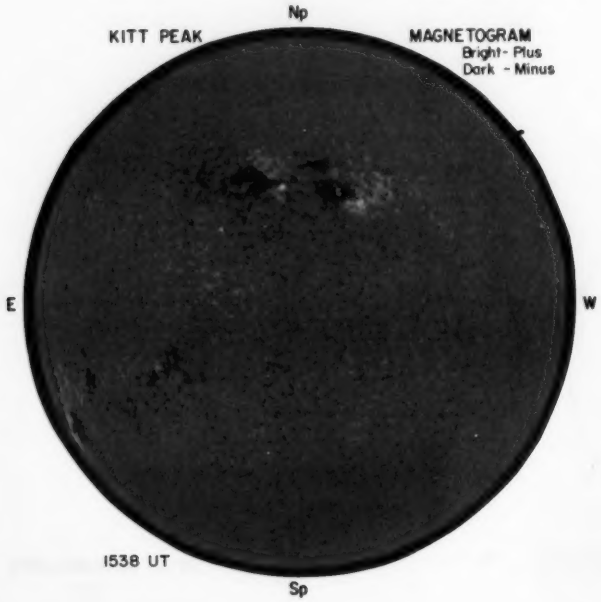
Ant. Temp. Unit 100°K

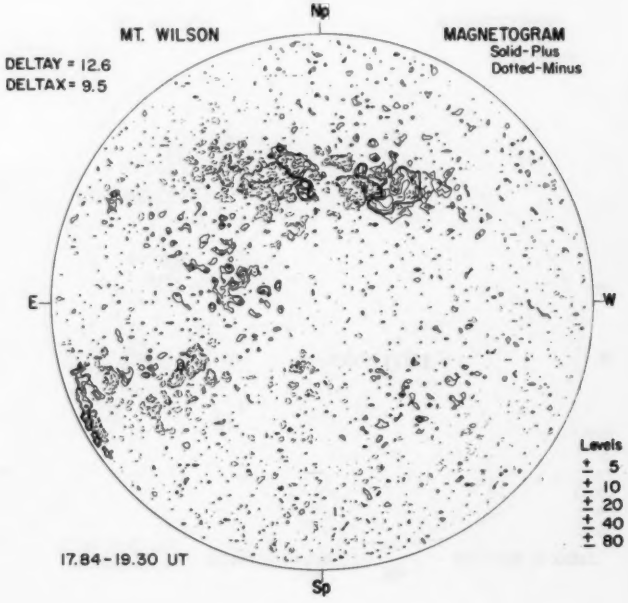
95
Jan 78

JANUARY 26, 1978 (P =-9.54, B_o =-5.57, L_o =251.12)

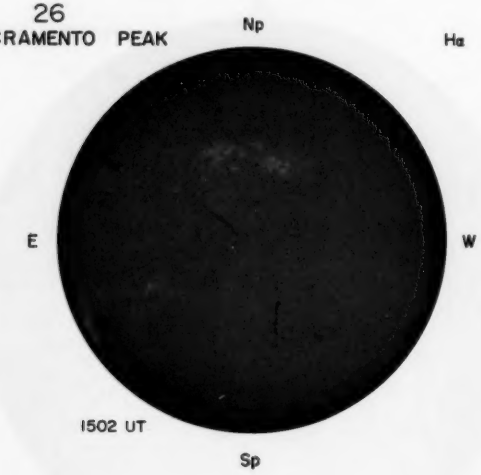




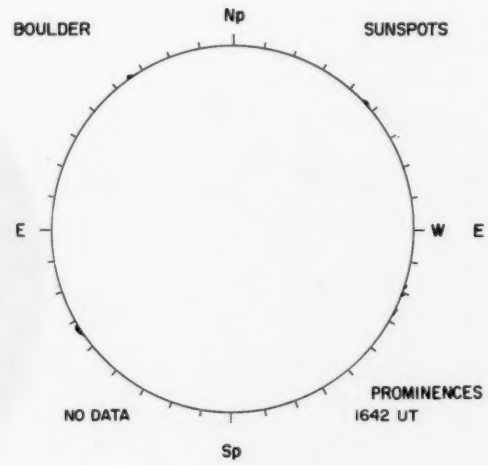




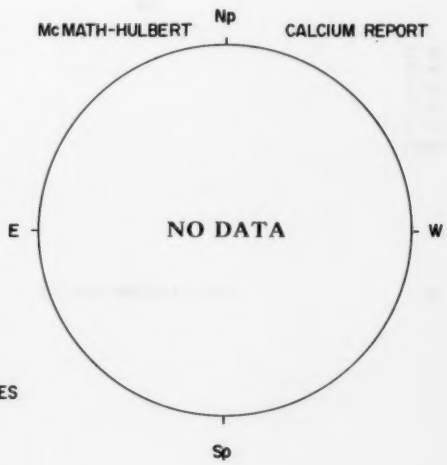
SACRAMENTO PEAK



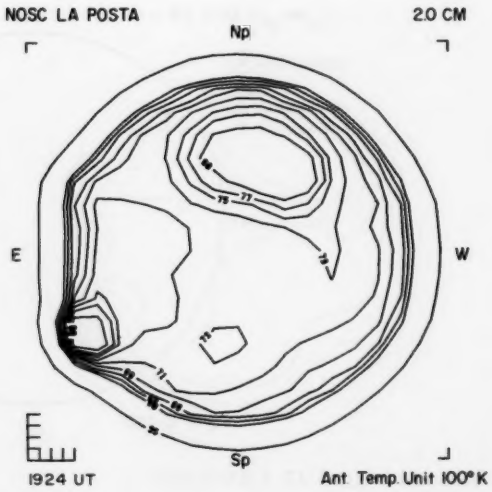
BOULDER SUNSPOTS



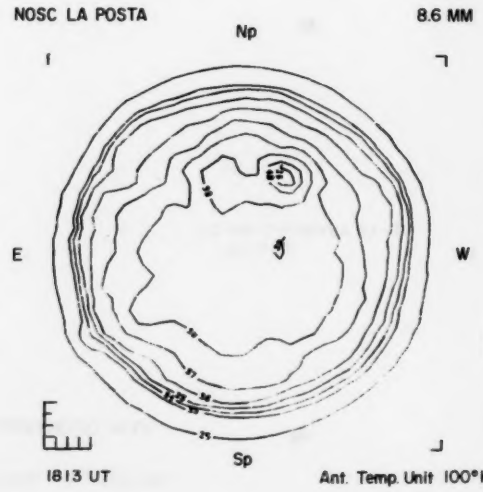
McMATH-HULBERT CALCIUM REPORT



NOSC LA POSTA 2.0 CM

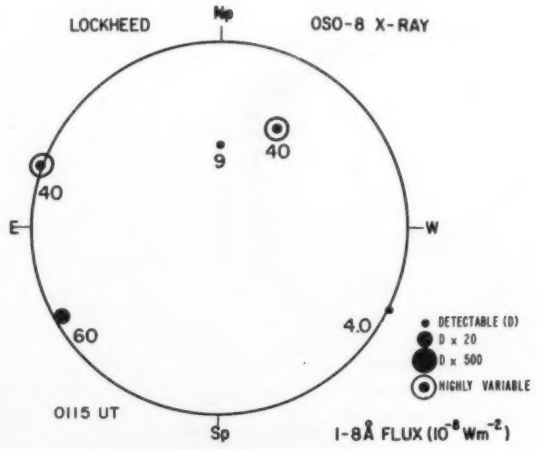


NOSC LA POSTA 8.6 MM



JANUARY 27, 1978 (P =-9.97, B_o =-5.65, L_o =237.95)

LOCKHEED OSO-8 X-RAY



0115 UT

1-8Å FLUX (10^{-8} Wm^{-2})

SACRAMENTO PEAK

Np

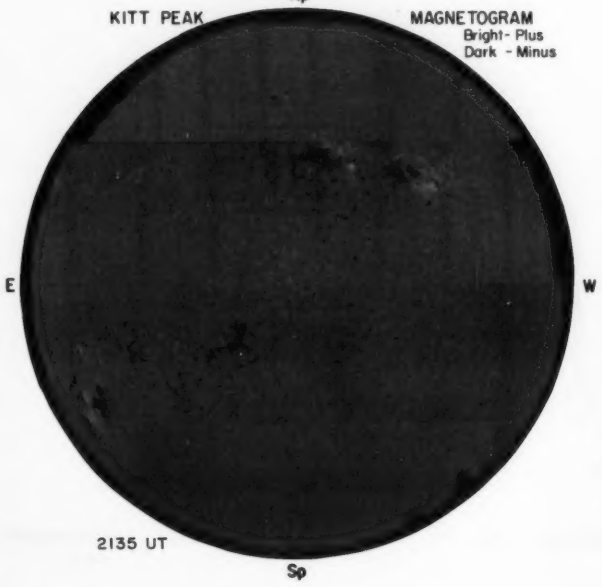
CORONA (1.15 $R_\odot$)
5303 Å

E NO DATA JANUARY 27-31 W

Sp

KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus

Np



2135 UT

MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus

DELTAY =
DELTAX =

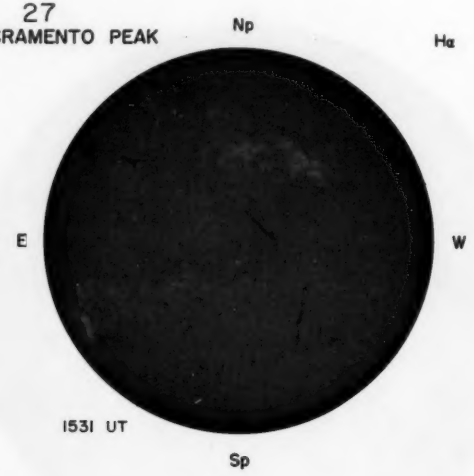
E NO DATA JANUARY 27-31 W

Levels
± 5
± 10
± 20
± 40
± 80

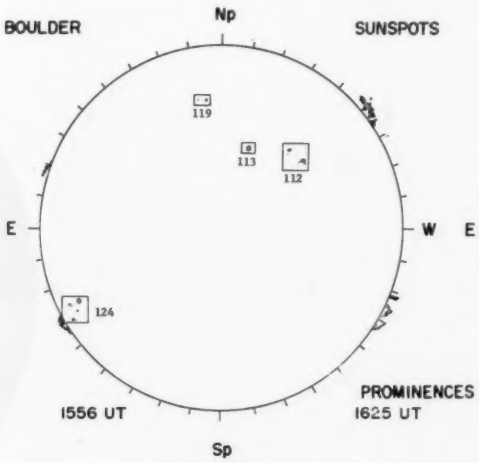
Sp

27

SACRAMENTO PEAK



Hα BOULDER



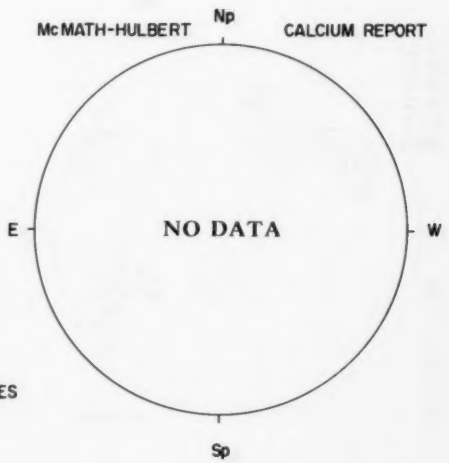
SUNSPOTS

PROMINENCES

1625 UT

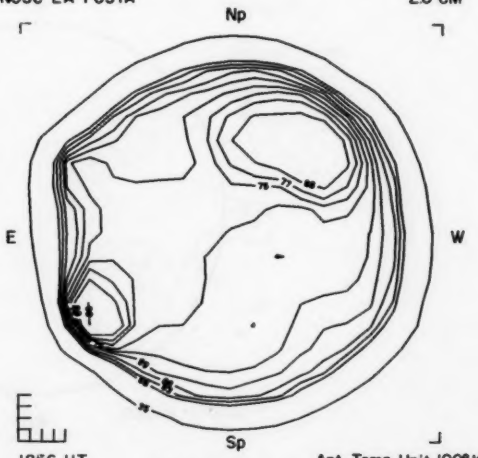
McMATH-HULBERT

CALCIUM REPORT



NOSC LA POSTA

2.0 CM



Ant. Temp. Unit 100°K

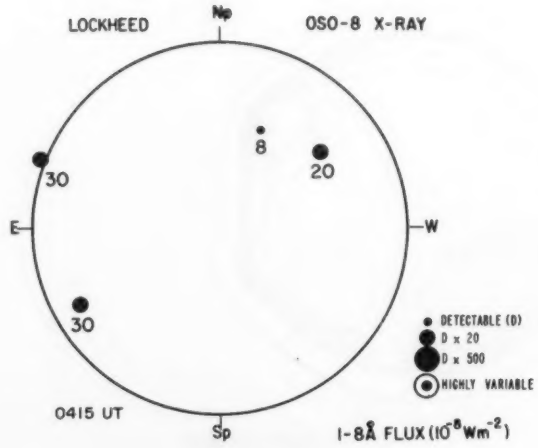
NOSC LA POSTA

8.6 MM

Ant. Temp. Unit 100°K

JANUARY 28, 1978 (P =-10.40, B_o =-5.73, L_o =224.79)

LOCKHEED OSO-8 X-RAY



0415 UT

1-8Å FLUX (10^{-8} Wm^{-2})

SACRAMENTO PEAK

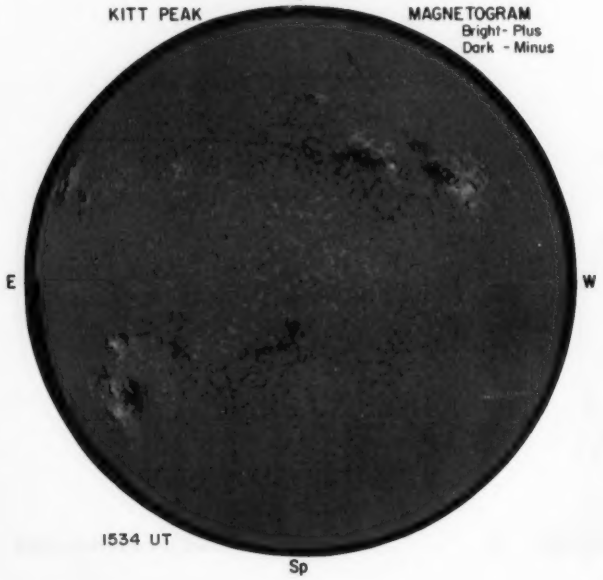
Np

E W

Sp

CORONA (1.15 $R_\odot$)
5303 Å

KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus



1534 UT

MT. WILSON

DELTAY =
DELTAX =

Np

E W

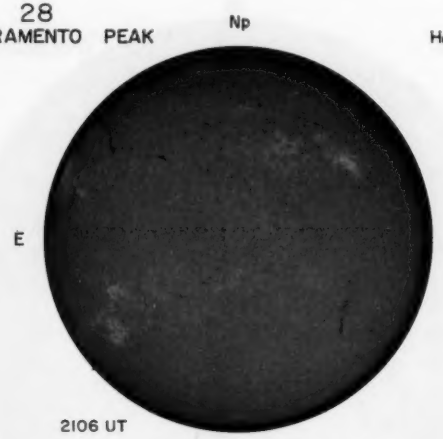
Sp

MAGNETOGRAM
Solid - Plus
Dotted - Minus

Levels
± 5
± 10
± 20
± 40
± 80

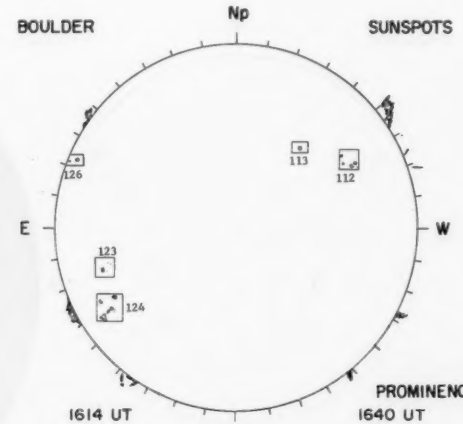
28

SACRAMENTO PEAK



2106 UT

Hα BOULDER



1614 UT

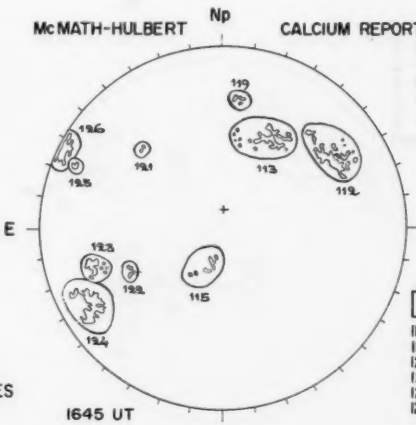
SUNSPOTS

PROMINENCES

1640 UT

McMATH-HULBERT

CALCIUM REPORT

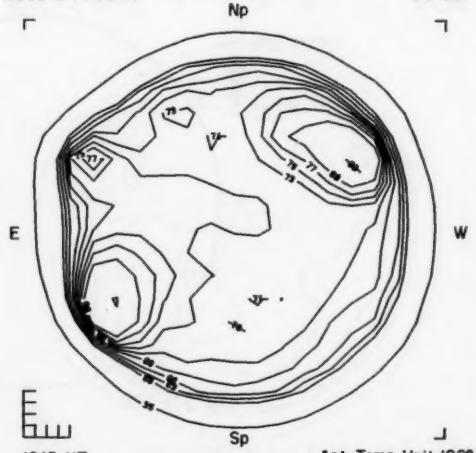


1645 UT

FAIR	M
112 - 3300 - 2.5	
113 - 2400 - 2.5	
123 - 0900 - 3.5	
124 - 4300 - 3.5	
125 - 0400 - 3.5	
126 - 3000 - 3.5	

NOSC LA POSTA

2.0 CM



1915 UT

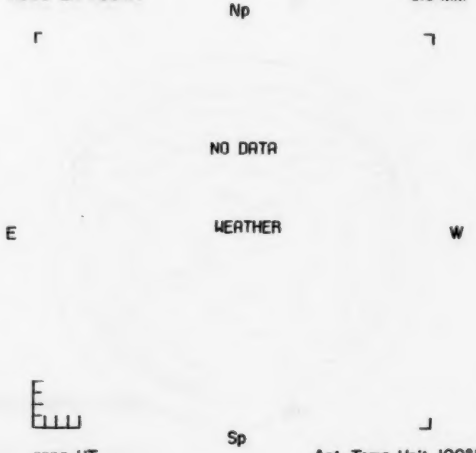
Ant. Temp. Unit 100°K

NOSC LA POSTA

8.6 MM

NO DATA

WEATHER

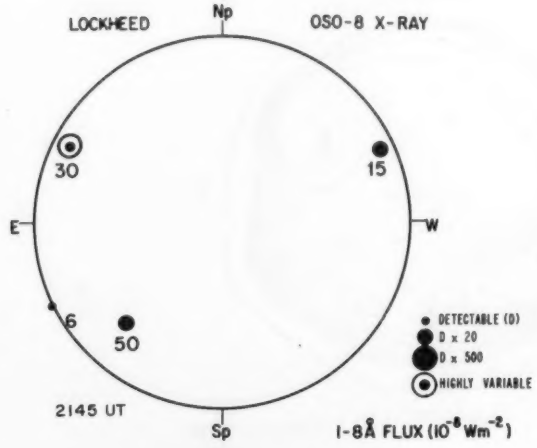


---- UT

Ant. Temp. Unit 100°K

JANUARY 29, 1978 (P =-10.82, B_o =-5.80, L_o =211.62)

LOCKHEED OSO-8 X-RAY



DETECTABLE (D)
D x 20
D x 500
HIGHLY VARIABLE

2145 UT

1-8Å FLUX (10^{-8} Wm^{-2})

SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å

KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus

1723 UT

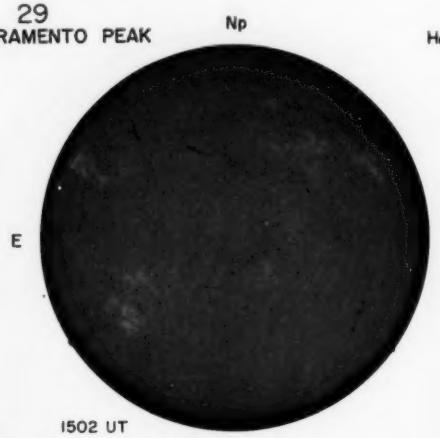
MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus

DELTAY =
DELTAX =

Levels
± 5
± 10
± 20
± 40
± 80

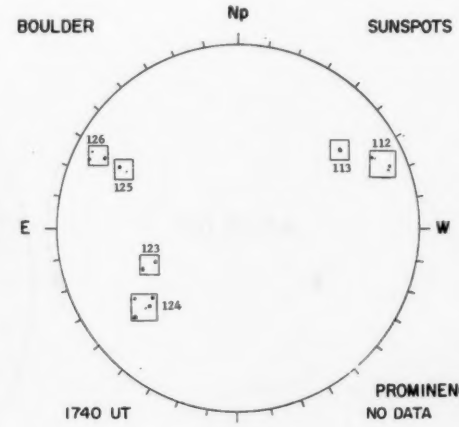
29

SACRAMENTO PEAK



1502 UT

BOULDER



1740 UT

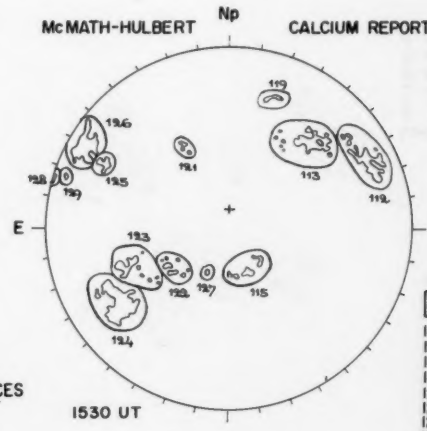
SUNSPOTS

PROMINENCES

NO DATA

McMATH-HULBERT

CALCIUM REPORT

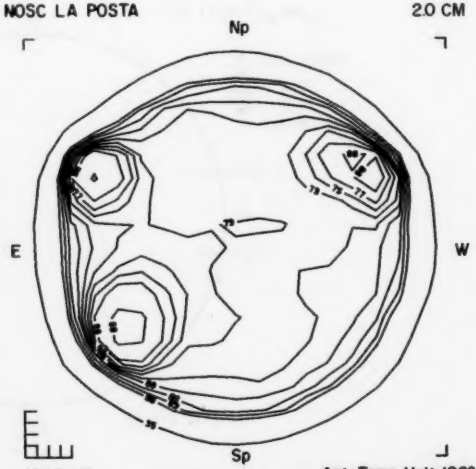


1530 UT

FAIR	S
112 - 3200 - 3.0	
113 - 2700 - 2.5	
115 - 0700 - 2.5	
122 - 0600 - 2.5	
123 - 1200 - 3.0	
124 - 4500 - 3.5	
125 - 0700 - 3.5	
126 - 4800 - 3.5	

NOSC LA POSTA

2.0 CM

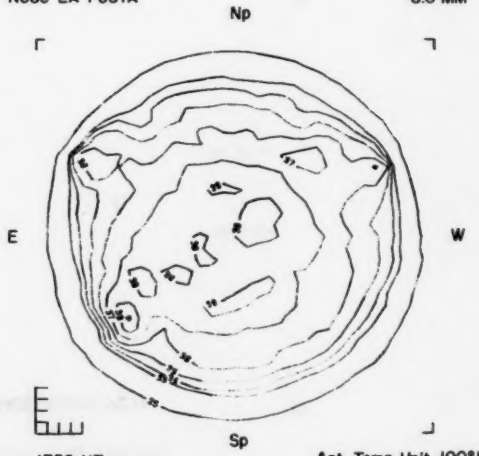


1848 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA

8.6 MM

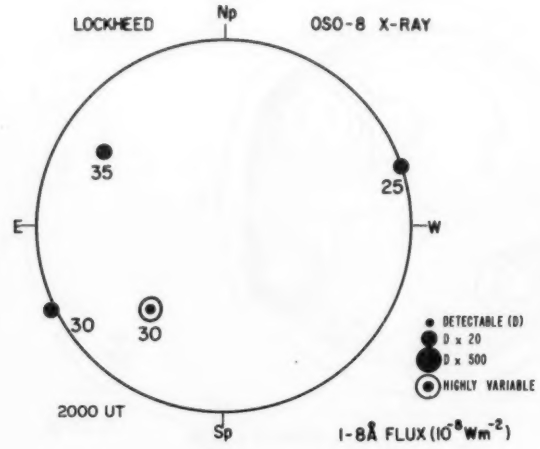


1750 UT

Ant. Temp. Unit 100°K

JANUARY 30, 1978 (P =-11.24, B_o =-5.88, L_o =198.45)

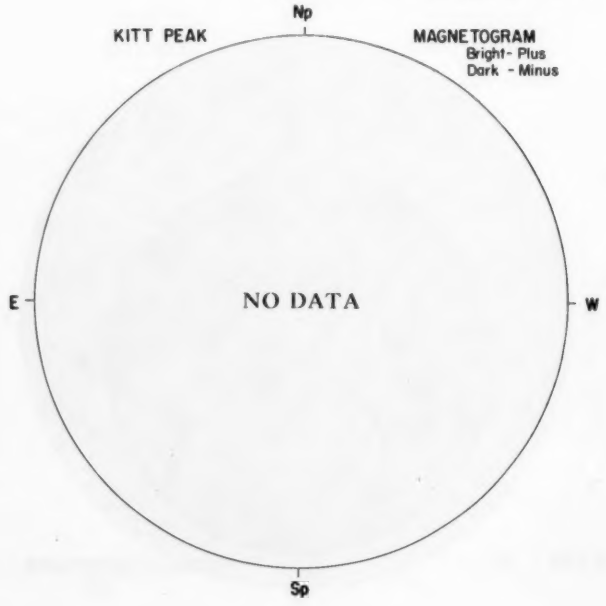
LOCKHEED OSO-8 X-RAY



I-8Å FLUX (10^{-8} Wm^{-2})

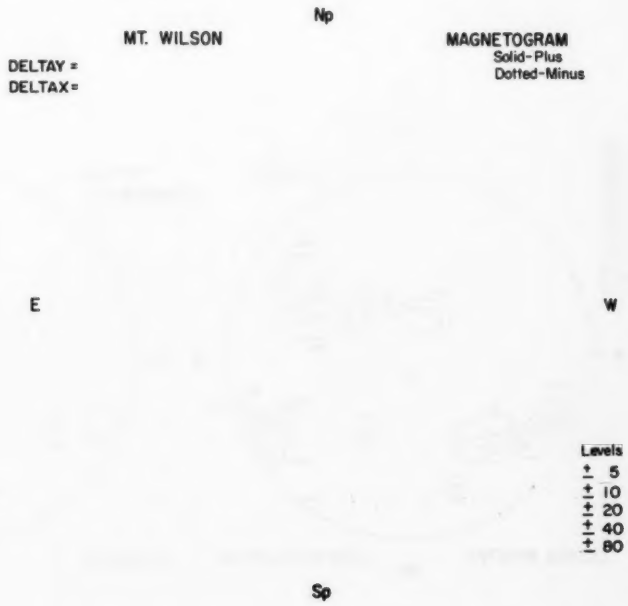
SACRAMENTO PEAK

KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus



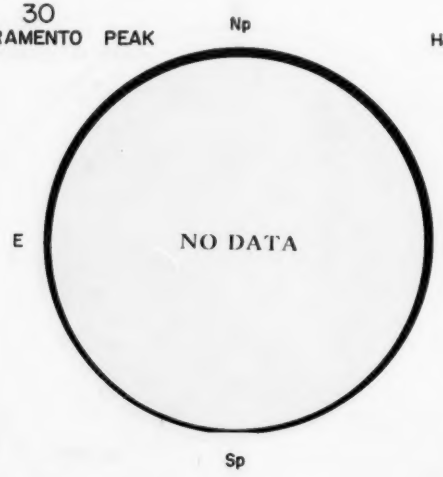
MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus

DELTAY =
DELTAX =



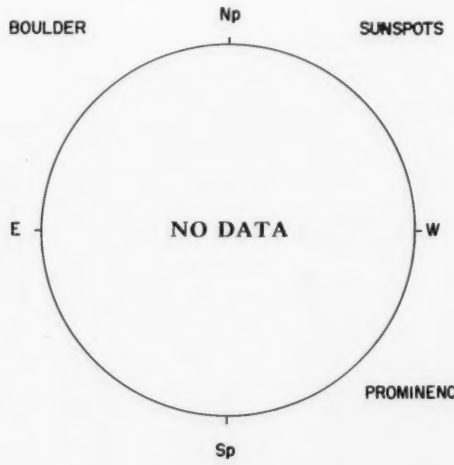
30

SACRAMENTO PEAK



Hα

BOULDER

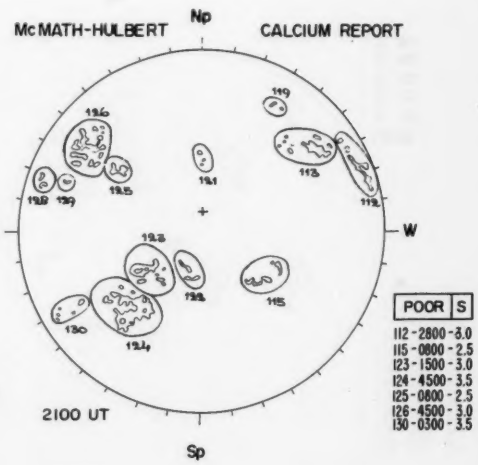


SUNSPOTS

PROMINENCES

McMATH-HULBERT

CALCIUM REPORT

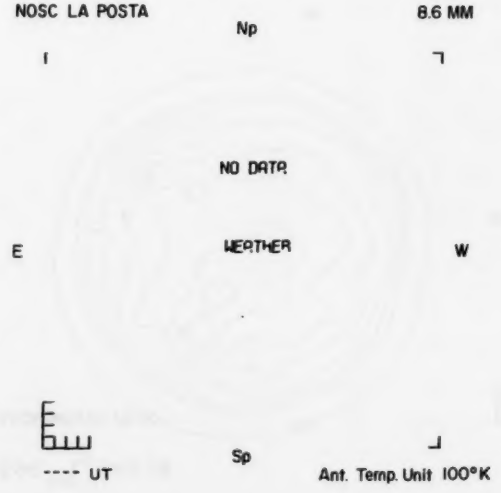


NOSC LA POSTA

2.0 CM

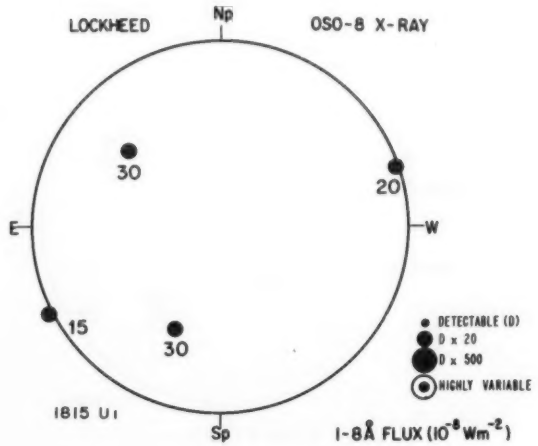
NOSC LA POSTA

8.6 MM



JANUARY 31, 1978 (P=-11.66, B_0=-5.96, L_0=185.29)

LOCKHEED



OSO-8 X-RAY

DETECTABLE (D)
D x 20
D x 500
HIGHLY VARIABLE

1815 UT

1-8Å FLUX (10^{-8} Wm^{-2})

SACRAMENTO PEAK

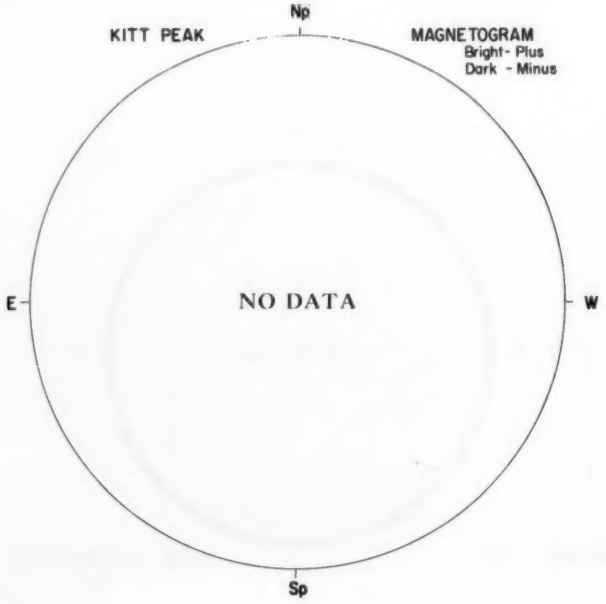
Np

E W

Sp

CORONA (1.15 $R_\odot$)
5303 Å

KITT PEAK



MAGNETOGRAM
Bright - Plus
Dark - Minus

MT. WILSON

DELTAY =
DELTAX =

Np

E W

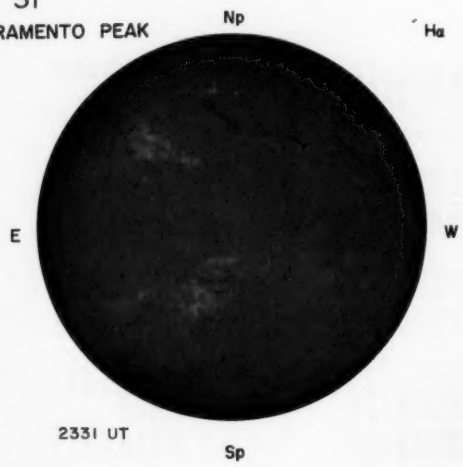
Sp

MAGNETOGRAM
Solid - Plus
Dotted - Minus

Levels
± 5
± 10
± 20
± 40
± 80

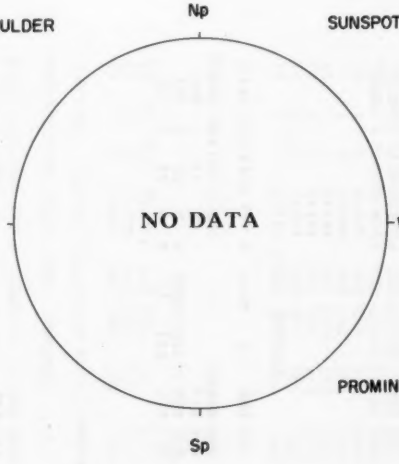
31

SACRAMENTO PEAK



2331 UT

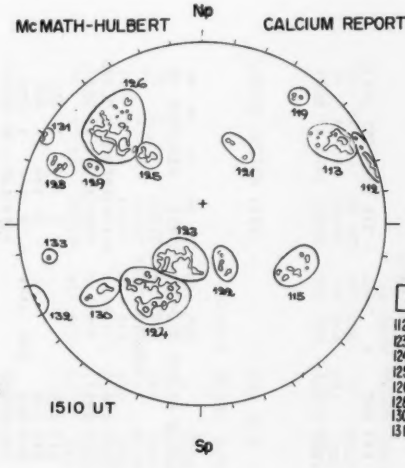
Hα BOULDER



SUNSPOTS

PROMINENCES

McMATH-HULBERT



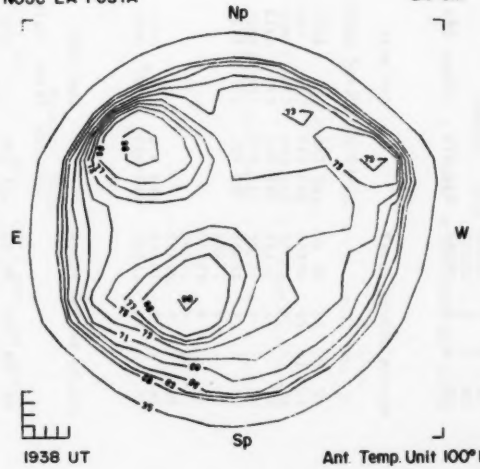
1510 UT

CALCIUM REPORT

FAIR | S

112 -2600 - 3.0
123 -2000 - 3.5
124 -4500 - 3.5
125 -0800 - 3.0
126 -4900 - 3.5
128 -0500 - 2.5
130 -0600 - 3.0
131 -0500 - 2.5

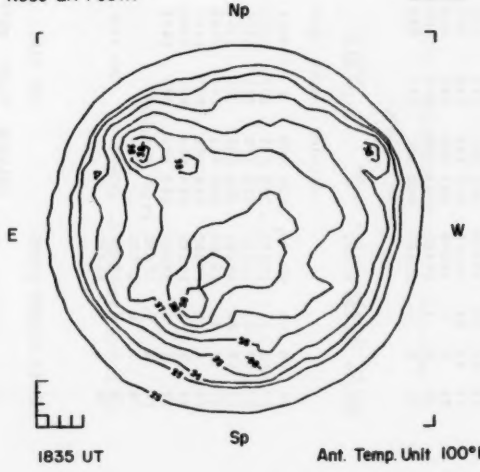
NOSC LA POSTA 2.0 CM



1938 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA 8.6 MM



1835 UT

Ant. Temp. Unit 100°K

REGIONS OF SOLAR ACTIVITY

JANUARY 1978

MCMATH REGION 15079 CMP DATE 1.1 RETURN OF REGION 15057 ROTATION 2

CALCIUM PLAGE DATA								SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	12	25	15079	N20 E86	219	300	1.0									
77	12	26	15079	N20 E74	218	300	2.0									
77	12	27	15079	N21 E61	217	300	2.0		N21 E76				B	40	2	DSO
77	12	28	15079	N21 E47	217	300	2.0									
77	12	31	15079	N21 E06	218	300	2.0									
78	1	2	15079	N21 W23	220	300	1.5									
78	1	3	15079	N21 W36	220	200	1.0									
78	1	4	15079	N20 W49	221	200	1.0									

MCMATH REGION 15081 CMP DATE 2.2 RETURN OF PART OF REGION 15049 ROTATION 3

CALCIUM PLAGE DATA								SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	12	26	15081	S16 E85	207	400	2.5		S18 E85				H	170	1	HSX
77	12	27	15081	S16 E75	203	1000	3.5									
77	12	28	15081	S18 E62	202	1500	3.5		S17 E59				B	250	3	DSO
77	12	31	15081	S19 E21	203	2400	3.0		S18 E30				H	190	15	DAI
78	1	2	15081	S19 W06	203	2100	3.0	19923	S18 W12	205	(AP)	4	B	160	3	CSO
78	1	3	15081	S19 W19	203	2200	3.0		S13 W23				B	120	3	CSO
78	1	4	15081	S20 W30	202	1400	3.0		S13 W36				B	20	3	CAO
78	1	5	15081						S18 W50				B	120	11	CAI
78	1	6	15081						S18 W60				B	140	5	CAO
78	1	7	15081					19923	S20 W76	203	(B)	4	B	150	5	CAO
78	1	8	15081					19923	S22 W87	203	D	2	H	220	6	DAO

MCMATH REGION 15095 CMP DATE 3.9

CALCIUM PLAGE DATA								SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	1	4	15095	N15 W09	181	200	2.0									
78	1	5	15095						N18 W29				B	20	6	BXO
78	1	6	15095						N18 W37				B	20	3	BXO
78	1	7	15095					19928	N14 W59	186	(AP)	4	B	10	1	AXX
78	1	8	15095					19928	N13 W71	187	AP	3	H	20	1	HRX
78	1	9	15095	N16 W76	181	600	2.0									

MCMATH REGION 15083 CMP DATE 4.2 RETURN PART OF REGION 15049, AND NEW ROTATION 3

CALCIUM PLAGE DATA								SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	12	26	15083	S20 E80	184	800	2.5		S16 E85				B	100	3	DAI
77	12	31	15083	S19 E45	179	3900	3.5		S18 E55				H	220	17	EAI
78	1	2	15083	S18 E20	177	4300	3.0	19924	S19 E13	180	(BP)	4	B	260	14	DSI
78	1	3	15083	S18 E07	177	3800	3.0		S13 E02				B	80	10	CAO
78	1	4	15083	S20 W05	177	3200	3.0		S13 W12				B	60	4	DSO
78	1	5	15083						S18 W25				B	90	5	DSO
78	1	6	15083						S17 W36				B	70	7	DSO
78	1	7	15083					19924	S20 W52	179	(AP)	4	B	70	8	DSO
78	1	8	15083					19924	S20 W63	179	AP	2	H	70	4	DSO
78	1	9	15083	S20 W70	175	2800	3.0		S19 W66				H	20	3	CRO
78	1	10	15083	S20 W83	175	2500	3.0									

MCMATH REGION 15090 CMP DATE 5.2

CALCIUM PLAGE DATA								SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	12	31	15090	N37 E65	159	800	2.5									
78	1	2	15090	N38 E35	162	1000	3.0	19925	N35 E31	162	(B)	4	B	40	2	BXO
78	1	3	15090	N38 E20	164	1100	2.5		N40 E20				B	50	3	CSO
78	1	4	15090	N37 E08	164	700	2.5		N40 E05				B	40	4	DSO
78	1	5	15090						N38 W04				B	20	5	BXO

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MCMATH REGION 15096 CMP DATE 5.2

				CALCIUM		PLAGE DATA			SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD		L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	1	9	15096	S35 W58		163	300	1.5									
78	1	10	15096	S34 W71		163	400	2.0									

MCMATH REGION 15087 CMP DATE 5.6 POSSIBLE RETURN OF REGION 15065 OR NEW ROTATION 2

				CALCIUM		PLAGE DATA			SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD		L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	12	31	15087	N17 E67		157	2000	3.5									
78	1	2	15087	N17 E39		158	1400	3.0									
78	1	3	15087	N17 E26		158	1100	3.0									
78	1	4	15087	N17 E13		159	700	3.0									
78	1	9	15087	N17 W52		157	600	1.5									
78	1	10	15087	N17 W65		157	500	1.5									
78	1	11	15087	N17 W78		157	500	1.0									

MCMATH REGION 15088 CMP DATE 6.2

				CALCIUM		PLAGE DATA			SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD		L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	12	31	15088	N32 E80		144	1000	2.0									
78	1	2	15088	N32 E46		151	1500	2.5									
78	1	3	15088	N32 E33		151	1800	2.0									
78	1	4	15088	N31 E20		152	1000	2.0									
78	1	9	15088	N32 W45		150	1000	1.5									
78	1	10	15088	N32 W59		151	800	1.5									
78	1	11	15088	N32 W73		152	800	1.5									

MCMATH REGION 15091 CMP DATE 6.4

				CALCIUM		PLAGE DATA			SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD		L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	1	2	15091	N10 E50		147	200	1.5									
78	1	3	15091	N09 E37		147	200	1.5									

MCMATH REGION 15086 CMP DATE 7.0 RETURN OF PART OF REGION 15056 ROTATION 3

				CALCIUM		PLAGE DATA			SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD		L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	12	31	15086	S24 E76		148	1800	3.0									
78	1	2	15086	S24 E53		144	2000	2.5	19926	S25 E41	152	(AP)	3	B	10	1	AXX
78	1	3	15086	S25 E41		143	2000	2.5									
78	1	4	15086	S26 E30		142	2000	2.0									
78	1	9	15086	S26 W35		140	1200	2.0									
78	1	10	15086	S26 W47		139	900	2.0									
78	1	11	15086	S27 W60		139	900	2.0									
78	1	12	15086	S28 W73		138	800	2.0									

MCMATH REGION 15089 CMP DATE 7.0

				CALCIUM		PLAGE DATA			SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD		L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	12	31	15089	N24 E85		139	800	2.5									
78	1	2	15089	N22 E55		142	2100	3.0	19927	N22 E55	138	(B)	3	B	10	2	BXO
78	1	3	15089	N21 E42		142	2000	3.0		N28 E47				B	8	1	AXX
78	1	4	15089	N21 E30		142	1500	3.0		N21 E30				B	20	1	AXX
78	1	5	15089							N21 E16				B	30	5	CAO
78	1	6	15089							N25 E03				B	30	7	DSO
78	1	9	15089	N21 W35		140	1300	2.5									
78	1	10	15089	N21 W48		140	1400	2.5									
78	1	11	15089	N22 W61		140	1500	3.0									
78	1	12	15089	N22 W75		140	1500	2.0									

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MCMATH REGION 15092 CMP DATE 9.0

CALCIUM PLAGE DATA

YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT
78	1	2	15092	N18 E85	112	1200	1.5
78	1	3	15092	N17 E71	113	1200	3.5
78	1	4	15092	N17 E58	114	900	3.0
78	1	7	15092				
78	1	9	15092	N17 W08	113	600	2.5
78	1	10	15092	N17 W21	113	600	2.5
78	1	11	15092	N17 W34	113	800	2.5
78	1	12	15092	N17 W48	113	700	2.0
78	1	14	15092	N17 W76	114	300	2.0

SUNSPOT DATA

NW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
	N17 E70				B	20	4	BXX
	N18 E53				B	10	2	BXO
	N18 E13				B	10	1	AXX

MCMATH REGION 15093 CMP DATE 9.0 RETURN OF PART OF REGION 15056 ROTATION 3

CALCIUM PLAGE DATA

YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT
78	1	2	15093	S28 E78	119	800	2.0
78	1	3	15093	S27 E66	118	800	2.5
78	1	4	15093	S27 E54	118	500	2.0
78	1	6	15093				
78	1	8	15093				
78	1	9	15093	S27 W09	114	900	2.0
78	1	10	15093	S27 W22	114	800	2.5
78	1	11	15093	S27 W35	114	900	2.5
78	1	12	15093	S28 W48	113	900	2.5
78	1	14	15093	S28 W75	113	700	2.0
78	1	15	15093	S30 W88	114	500	1.0

SUNSPOT DATA

NW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
	S23 E22				B	30	2	BXO
19929	S24 E02	114	X	1	H	10	2	BXO

MCMATH REGION 15104 CMP DATE 11.9

CALCIUM PLAGE DATA

YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT
78	1	12	15104	S26 W10	75	200	2.5
78	1	13	15104				
78	1	14	15104	S23 W33	71	800	3.0
78	1	16	15104				
78	1	18	15104	S24 W86	73	400	1.5

SUNSPOT DATA

NW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
19930	S30 W24	74	(AP)	3	B	20	1	HRX
	S26 W30				H	20	5	CRO
	S25 W67				B	10	1	AXX

MCMATH REGION 15097 CMP DATE 12.9

CALCIUM PLAGE DATA

YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT
78	1	9	15097	N22 E48	57	500	2.0
78	1	10	15097	N21 E34	58	800	2.5
78	1	11	15097	N19 E16	63	1100	3.0
78	1	12	15097	N19 E03	62	1000	3.0
78	1	13	15097				
78	1	14	15097	N19 W25	63	1500	3.0
78	1	15	15097	N19 W39	65	2000	3.0
78	1	16	15097				
78	1	17	15097				
78	1	18	15097	N19 W80	67	2000	2.5

SUNSPOT DATA

NW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
	N19 E29				R	30	6	BXO
	N18 E12				B	100	10	XX
19931	N17 W18	66	(B)	4	B	80	12	DSI
	N18 W34				H	80	8	CRO
	N19 W59				B	80	2	CSO
	N18 W76				B	60	3	CSO
19931	N20 W85	72	AF	2	R	40	3	AXX

MCMATH REGION 15098 CMP DATE 13.8 RETURN OF PART OF REGION 15067 ROTATION 3

CALCIUM PLAGE DATA

YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT
78	1	9	15098	N15 E58	47	500	2.5
78	1	10	15098	N17 E45	47	300	1.5
78	1	11	15098	N17 E31	48	300	1.5
78	1	12	15098	N17 E17	48	400	1.5
78	1	14	15098	N17 W12	50	600	1.5
78	1	15	15098	N17 W27	53	800	1.5
78	1	18	15098	N17 W65	52	400	2.0

SUNSPOT DATA

NW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
	N18 E11				H	80	12	DRO
	N18 W18				H	90	13	DRO

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MCMATH REGION 15102 CMP DATE 14.3

			CALCIUM PLAGE DATA					SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	1	10	15102	S27 E50	42	200	1.0									
78	1	11	15102	S27 E36	43	200	1.5									
78	1	12	15102	S28 E22	43	100	1.0									

MCMATH REGION 15111 CMP DATE 14.5

			CALCIUM PLAGE DATA					SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	1	18	15111	S23 W54	41	100	1.5									

MCMATH REGION 15099 CMP DATE 15.1 RETURN OF PART OF REGION 15067 ROTATION 4

			CALCIUM PLAGE DATA					SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	1	9	15099	N24 E75	30	800	1.0									
78	1	10	15099	N23 E60	32	600	1.0									
78	1	11	15099	N24 E46	33	400	1.5									
78	1	12	15099	N24 E32	33	400	1.5									
78	1	14	15099	N23 E05	33	300	1.5									
78	1	15	15099	N22 W10	36	400	1.5									
78	1	18	15099	N22 W48	35	200	1.0									

MCMATH REGION 15103 CMP DATE 15.8

			CALCIUM PLAGE DATA					SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	1	11	15103	N42 E55	24	100	1.0									
78	1	12	15103	N42 E42	23	100	1.0									
78	1	14	15103	N42 E14	24	300	1.0									
78	1	15	15103	N41 E02	24	300	1.0									
78	1	18	15103	N41 W29	16	100	1.0									

MCMATH REGION 15106 CMP DATE 15.9

			CALCIUM PLAGE DATA					SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	1	14	15106	S28 E16	22	100	1.5									

MCMATH REGION 15100 CMP DATE 17.9

			CALCIUM PLAGE DATA					SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	1	11	15100	S24 E84	356	1800	3.5									
78	1	12	15100	S24 E71	355	2300	3.0		S23 E73				H	20	2	BXO
78	1	13	15100					19932	S18 E51	0	X	1	B	10	2	BXO
78	1	14	15100	S24 E42	357	2100	3.0		S23 E46				H	10	2	BXO
78	1	15	15100	S24 E30	357	2100	3.0		S27 E23				H	20	6	BXO
78	1	16	15100						S26 E12				B	10	5	BXO
78	1	17	15100						S26 W01				B	20	5	BXO
78	1	18	15100	S25 W09	356	2400	3.0	19933	S28 W15	2	X	2	R	10	3	BXO
78	1	19	15100						S27 W16				H	20	3	BXO
78	1	20	15100					19934	S36 W26	347	(AP)	2	H	20	4	CRO
78	1	21	15100	S25 W50	355	2400	3.0	19935	S26 W45	353	(B)	2	B	90	22	DSI
78	1	22	15100	S25 W59	354	2400	3.5	19935	S24 W59	352	B	2	B	270	10	DAO
78	1	23	15100	S25 W72	351	2200	3.0	19935	S23 W71	352	(B)	2	H	290	13	DAO
78	1	24	15100	S25 W85	353	1700	2.5		S24 W75				H	340	9	DRO

MCMATH REGION 15101 CMP DATE 17.9

			CALCIUM PLAGE DATA					SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	1	11	15101	N14 E87	353	800	1.5									
78	1	12	15101	N16 E75	351	1100	3.0									
78	1	14	15101	N16 E43	356	1000	3.0									

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MCMATH REGION 15101 (CONT) CMP DATE 17.9

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	HW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	1	15	15101	N15 E31	356	800	3.0									
78	1	18	15101	N15 W09	356	800	2.5									
78	1	21	15101	N15 W50	355	400	1.5									
78	1	22	15101	N15 W59	354	400	1.5									
78	1	23	15101	N15 W78	357	400	1.0									

MCMATH REGION 15105 CMP DATE 18.5

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	HW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	1	12	15105	N31 E84	342	100	1.0									
78	1	14	15105	N31 E50	349	100	1.0									

MCMATH REGION 15116 CMP DATE 19.0

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	HW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	1	23	15116	N03 W63	342	200	1.5									

MCMATH REGION 15107 CMP DATE 20.8 RETURN OF REGION 15078 ROTATION 2

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	HW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	1	14	15107	N27 E87	312	700	1.5									
78	1	15	15107	N27 E70	317	900	1.5									
78	1	18	15107	N27 E27	320	700	2.0									
78	1	21	15107	N27 W14	319	300	1.0									
78	1	22	15107	N27 W24	319	400	1.0									
78	1	23	15107	N27 W38	317	400	1.0									
78	1	24	15107	N27 W51	319	200	1.0									

MCMATH REGION 15114 CMP DATE 22.5

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	HW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	1	22	15114	N29 W02	297	300	1.5									
78	1	23	15114	N28 W17	296	300	1.0									

MCMATH REGION 15117 CMP DATE 23.9

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	HW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	1	23	15117	S15 E01	278	200	2.0									

MCMATH REGION 15112 CMP DATE 25.8 RETURN OF REGION 15075 ROTATION 4

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	HW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	1	21	15112	N22 E52	253	1600	2.0									
78	1	22	15112	N21 E43	252	1800	3.0	19937	N21 E44	249	B	2	B	10	2	CRO
78	1	23	15112	N21 E28	251	2100	3.0	19937	N18 E31	250	(B)	2				
78	1	24	15112	N22 E15	253	2800	3.0	19937	N19 E16	251	(B)	3				
78	1	25	15112					19937	N19 E03	252	(B)	4				
78	1	26	15112					19937	N19 W13	254	(B)	4				
78	1	27	15112					19937	N19 W26	253	B	3	H	120	23	DAI
78	1	28	15112	N28 W38	252	3300	2.5	19937	N18 W48	254	(B)	5	B	140	8	DSI
78	1	29	15112	N20 W53	255	3200	3.0	19937	N18 W53	254	(BP)	4	B	120	3	CSO
78	1	30	15112	N20 W66	254	2800	3.0									
78	1	31	15112	N18 W80	256	2600	3.0		N18 W70				H	110	5	CSO

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MCMATH REGION 15113 CMP DATE 27.6 RETURN OF REGION 15088 ROTATION 2

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	1	21	15113	N24 E77	228	2500	2.5	19936	N19 E75	233	(AP)	3	B	100	2	CSO
78	1	22	15113	N24 E62	233	2600	3.5	19936	N20 E59	234	AP	3	B	70	2	CSO
78	1	23	15113	N24 E46	233	3000	3.0	19936	N21 E44	237	(AP)	3	H	70	2	CSO
78	1	24	15113	N24 E34	234	2800	3.0	19936	N21 E31	236	(AP)	4	H	60	3	CSO
78	1	25	15113					19936	N21 E17	238	(AP)	4	H	80	22	DRI
78	1	26	15113					19936	N21 E04	237	(AP)	4	H	100	24	DAI
78	1	27	15113					19936	N21 W10	237	AP	4	H	60	1	HSX
78	1	28	15113	N24 W15	229	2400	2.5	19936	N21 W22	236	(AP)	4	B	30	1	HSX
78	1	29	15113	N24 W30	232	2700	2.5	19936	N21 W35	236	(AP)	5	B	50	1	HSX
78	1	30	15113	N24 W44	230	2500	2.0									
78	1	31	15113	N24 W56	232	2800	2.0									
78	2	01	15113	N24 W70		2200	1.5	19936	N21 W75		(AP)	3	B	40	1	H
78	2	02	15113	N24 W85		1200	1.5						B	30	1	H

MCMATH REGION 15119 CMP DATE 28.2

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	1	28	15119	N39 W06	220	300	1.5									
78	1	29	15119	N39 W19	221	400	1.5									
78	1	30	15119	N39 W31	217	300	1.0									
78	1	31	15119	N39 W42	218	300	1.0									
78	2	01	15119	N39 W55		300	1.0									
78	2	02	15119	N40 W68		100	1.5									

MCMATH REGION 15120 CMP DATE 28.4

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	2	01	15120	N23 W55		200	1.0									
78	2	02	15120	N23 W68		300	1.5									

MCMATH REGION 15115 CMP DATE 29.1 RETURN OF REGION 15081 ROTATION 4

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	1	22	15115	S15 E86	209	500	1.0									
78	1	23	15115	S17 E70	209	1200	3.5		S17 E78				H	10	1	AXX
78	1	24	15115	S17 E60	208	700	3.5	19938	S17 E56	211	(AP)	3	H	10	1	AXX
78	1	25	15115					19938	S18 E43	212	(AP)	3	H	10	1	AXX
78	1	26	15115					19938	S17 E30	211	(AP)	3	H	10	1	AXX
78	1	28	15115	S17 E05	209	300	2.0									
78	1	29	15115	S18 W08	210	700	2.5									
78	1	30	15115	S19 W23	209	600	2.5									
78	1	31	15115	S19 W33	209	800	1.5									
78	2	01	15115	S19 W46		700	1.5									
78	2	02	15115	S19 W60		600	1.5									

MCMATH REGION 15127 CMP DATE 30.2

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	1	29	15127	S20 E07	195	100	1.5									

MCMATH REGION 15121 CMP DATE 30.9

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	1	28	15121	N20 E29	185	100	1.0									
78	1	29	15121	N20 E15	187	300	1.5									
78	1	30	15121	N19 E00	186	200	1.0									
78	1	31	15121	N19 W11	187	300	1.0									
78	2	01	15121	N20 W24		300	1.0									
78	2	02	15121	N21 W40		300	1.0									

REGIONS OF SOLAR ACTIVITY

JANUARY 1978

MCMATH REGION 15122 CMP DATE 31.1 RETURN OF PART OF REGION 15Ø83 ROTATION 2

				CALCIUM PLAGE DATA					SUNSPOT DATA						
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT		MW NO.	LAT CMD	L	MAG.	H STA	AREA	CNT CLASS
78	1	28	15122	S19 E32	182	300	2.0								
78	1	29	15122	S19 E19	183	600	2.5								
78	1	30	15122	S19 E03	183	600	2.0								
78	1	31	15122	S19 W08	184	600	1.5								
78	2	01	15122	S19 W21		300	1.5								
78	2	02	15122	S19 W34		400	1.5								
78	2	03	15122	S19 W46		300	1.0								
78	2	04	15122	S19 W59		200	1.0								

DAILY CALCIUM PLAGE INDEX

JANUARY 1978

YR	MO	DAY	INDEX	YR	MO	DAY	INDEX	YR	MO	DAY	INDEX
78	1	1	*	78	1	11	10.6	78	1	21	7.6
78	1	2	39.3	78	1	12	10.2	78	1	22	12.1
78	1	3	39.6	78	1	13	*	78	1	23	14.8
78	1	4	28.8	78	1	14	14.0	78	1	24	15.2
78	1	5	*	78	1	15	15.9	78	1	25	*
78	1	6	*	78	1	16	*	78	1	26	*
78	1	7	*	78	1	17	*	78	1	27	*
78	1	8	*	78	1	18	10.7	78	1	28	25.0
78	1	9	12.9	78	1	19	*	78	1	29	36.5
78	1	10	10.0	78	1	20	*	78	1	30	37.2
								78	1	31	43.7

* NO OBSERVATIONS

Note: No calcium spectroheliograms were secured at the McMath-Hulbert Observatory on January 1, 5, 6, 7, 8, 13, 16, 17, 19, 20, 25, 26 and 27, 1978.
No sunspot observations were made at Mt. Wilson on January 1, 3, 4, 5, 6, 9, 10, 11, 12, 14, 15, 16, 17, 19, 30 and 31, 1978.

SUDDEN IONOSPHERIC DISTURBANCES

JANUARY 1978

DAY	UNIVERSAL TIME START	END	MAX	IMP	WIDE SPREAD INDEX	NUMBER OF STATION REPORTS BY TIME SWF	SCNA	SEA	SPA	LF-SPA	SES	SFD	KNOWN FLARE	McMATH REGION
01	0513	0546	0516	1-	1				1				0510	X-RAY
01	0550	0816	0603	2	1				1				0554	15083
01	0918	1014	0955	1-	3			1	1				0920	15083
01	2146	2347	2201	1+	5	2			2	1	4	4	2145	15083
02	0344	0417	0352	1-	1				1				0345E	15083
02	1925	2000	1945	1-	3						3		0230	15080
03	0222	0406	0242	1	3	2			2				0230	15080
03	0929	1017D	0934	1-	1				1				0930E	15083
03	1017	1048	1027	1-	5			1	3		1		1015	15083
03	2233	2351	2240	1-	5				2		2		2228	X-RAY
04	0718	0805	0724	1-	1				1				0639	X-RAY
06	0657	0704	0658	1-	1				1				0659	X-RAY
06	1429	1448	1431	1-	1			1					1425	X-RAY
06	2308	2347	2318	1-	1				1				2307	X-RAY
07	0129	0306D	0143	1	1				1				0127	15083
07	0305	0433	0333	1+	1				1				0637E	15081
07	0631	0835	0653	2+	2				4		1		0637E	15081
07	1100	1116D	1116	1-	1				1		1		1103	X-RAY
07	1147	1500	1225	2+	5	2		3	4		2		1145	15081
08	0001	0142	0028	1-	1				1				0000	15083
08	0157	0631	0233	3-	3	1			1		1		0205	15081
08	0707	0921	0720	2	5			2	1				0710	15081
08	1900	2015	1930	1	5			1	1		8		1856	X-RAY
09	1220	1400	1237	2+	5			2	3		2		1213	X-RAY
17	0126	0214	0131	1-	1				1				0125	15100
17	1354	1500	1403	1-	3				2				1359E	15100
22	0639	0840	0651	1-	1				1				0640E	15100
25	0434	0540	0439	1-	1				1				0430	X-RAY
25	0632	0723	0638	1-	1				1				0629	15112
26	0639	0713	0650	1-	1				1				0636	15112
26	2048	2102	2052	1-	1				1				2044	X-RAY
26	2310	0046	2326	1-	3				2				2312	15112
27	0331	0434	0342	1+	3	1			1				0328	15107
27	0738	0820	0744	1-	1				1				0738	X-RAY
27	0850	0934	0856	1-	1				1				0855	15124
27	1020	1125	1038	1-	5			3	4		2		1021	15107
27	1325	1400	1334	1-	3			1	1		1		1322	X-RAY
27	1413	1545	1425	1-	5			1	2		1		1413	15107
27	1600	1715	1607	1+	5				1	1	8		1547	X-RAY
28	0543	0649	0548	1-	1				1				0540	X-RAY
28	0809	0842	0820	1-	1				1				0809	X-RAY
29	1319U	1352	1322	1-	1			1					*	
30	0139	0257D	0152	1	1				1				0139	15124

PERIODS OF NO OBSERVATIONS:

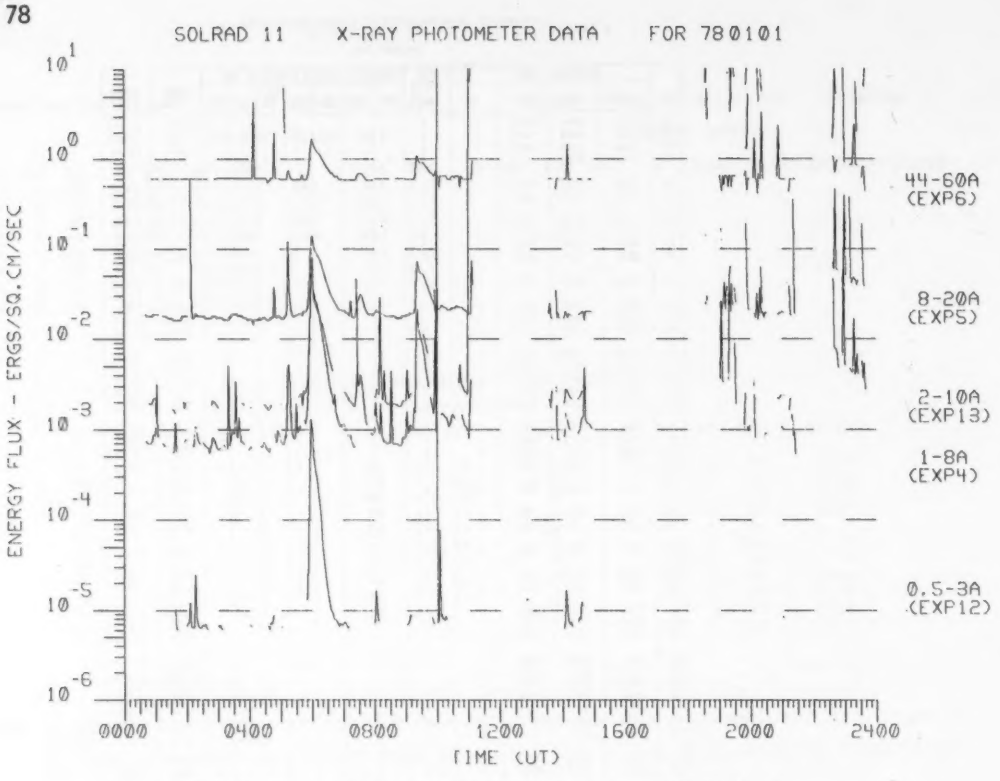
DATE	TIME (UT) and STATION
01	0010-0022 TM
03	1005-1348 UM (16 kHz), 1208-1342 UM (13 kHz)
05	0000-2400 A28
07	0127-1205 UM (13 kHz)
10	1006-1342 UM (16 kHz)
12	0920-1140 UM (16 kHz), 0920-1140 UM (13 kHz), 1915-2055 UM (13 kHz)
13-31	0000-2400 A26
17	1212-1340 UM (16 kHz), 2005-2050 UM (13 kHz)
18	1112-1214 TM
20-29	0000-2400 A28
20	0106-0158 UM (16 kHz), 0705-0755 UM (16 kHz), 1302-1358 UM (16 kHz), 1903-2005 UM (16 kHz)
21	0105-0200 UM (16 kHz), 0705-0755 UM (16 kHz) 1303-1358 UM (16 kHz), 1903-2000 UM (16 kHz)
23	1019-1223 UM (13 kHz), 1347-2400 UM (13 kHz)
24	0000-1032 UM (13 kHz), 1005-1348 UM (16 kHz) 1231-1340 UM (13 kHz), 2029-2102 UM (13 kHz)
25	0810-1345 UM (13 kHz)
26	0000-2400 A34, 0816-0905 UM (13 kHz)
28	0000-2400 A34
29-31	0000-2400 A40
31	0000-2400 A34, 1010-1400 UM (16 kHz), 1515-1528 TM

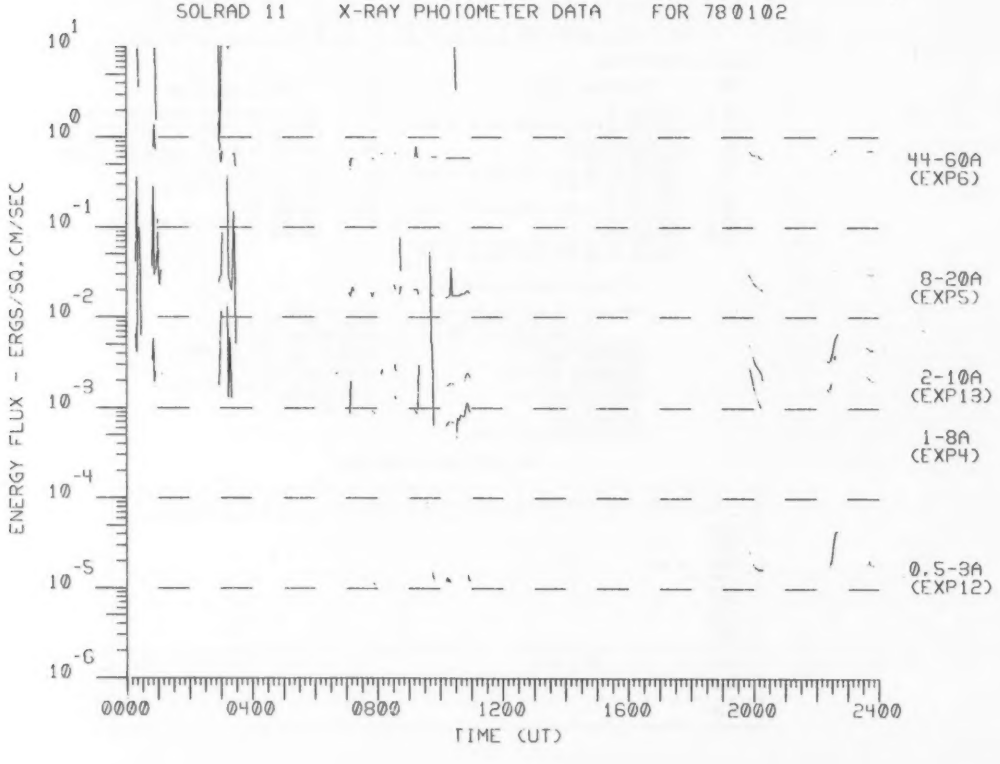
STATIONS REPORTING FOR JANUARY 1978

AAVSO (A1, A19, A21, A28, A30, A31, A34, A35, A40) (SES) (A1, A26, A31, A34) (SEA) (A31) (SWF)
DARMSTADT (DA) (SWF)
HAWAII (HA) (SFD)
HWESTMONCEUX (HC) (SEA)
HIRAISO (HI) (SWF)
HOBART (TA) (SEA, SES)
INUBO (IN) (SPA)
KONA (KH) (SFD)
KUHLUNGSBORN (KU) (SEA, SPA)
MAUI (MU) (SFD)
MC MATH (MC) (SWF, SCNA)
NEW JERSEY (NJ) (SES)
PANSKA VES (PU) (SWF, SEA, SES)
SAO PAULO (UQ) (SES, SPA)
ST CLOUD (SC) (SES)
TABLE MOUNTAIN (TH) (SPA, LF-SPA)
TORINO (TW) (SPA)
UPSEN (UI) (SEA)

SID's BY McMATH REGION

DAY	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
REGION																															
15080		1	1																												
15081							2	2																							
15083	3	1	2				1	1																							
15086							1																								
15100																	2					1									
15107																											3				
15112																									1	2					
15124																											1			1	
15126																															3
X-RAY	1		1	1		3	1	1	1																1	1	3	2			2
UNKNOWN																															
NO FP																													1		


SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780101
ENERGY FLUX - ERGS/SQ.CM/SEC
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
10^{-6}
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)


SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780102
ENERGY FLUX - ERGS/SQ.CM/SEC
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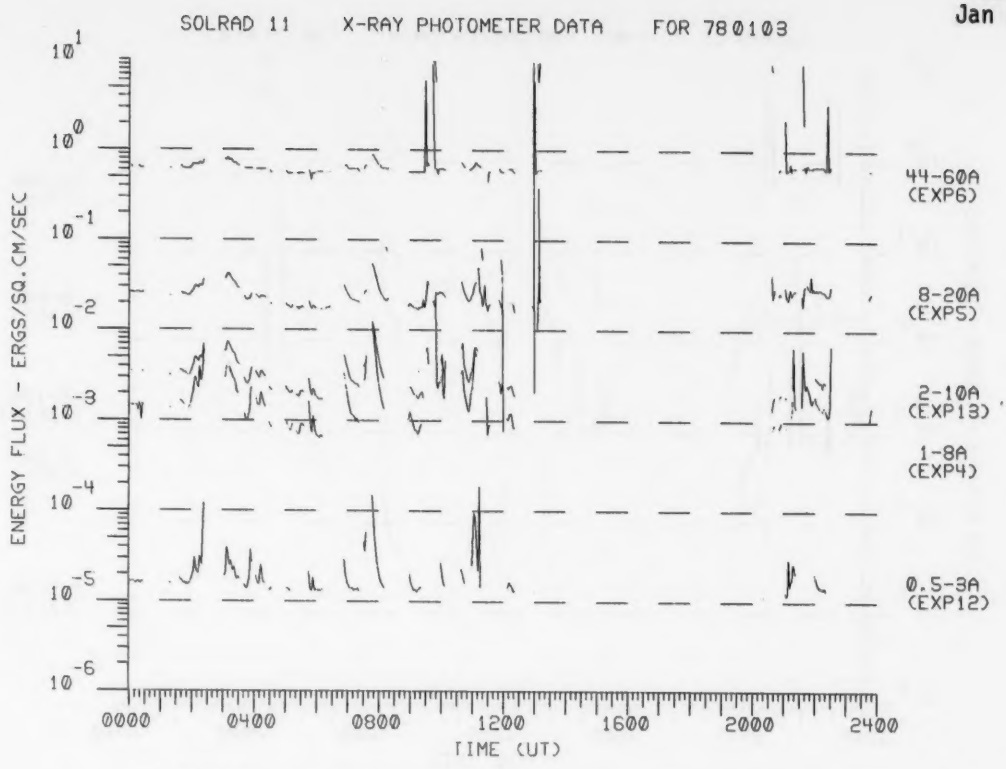
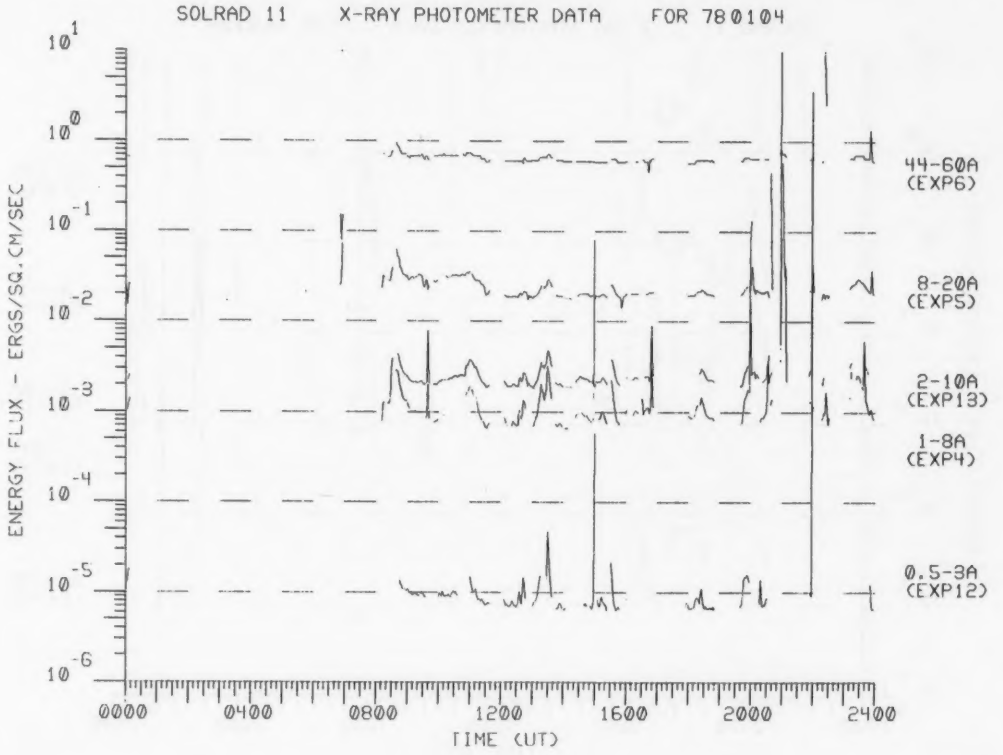
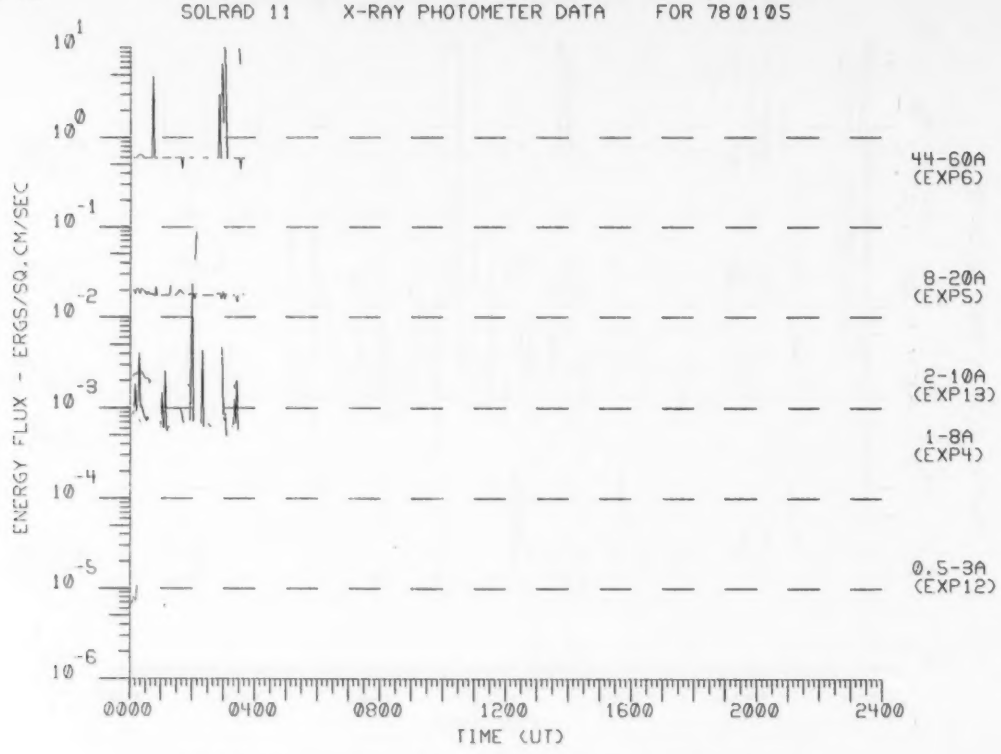
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
10^{-6}
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)

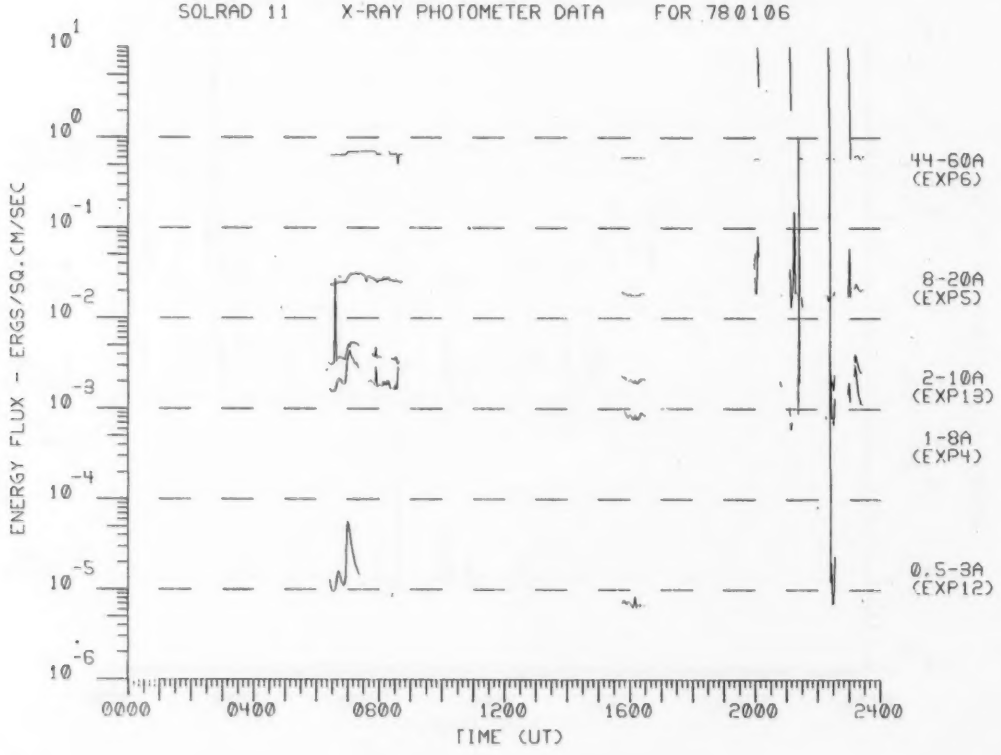

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780103
ENERGY FLUX - ERGS/SQ.CM/SEC
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
10^{-6}
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)

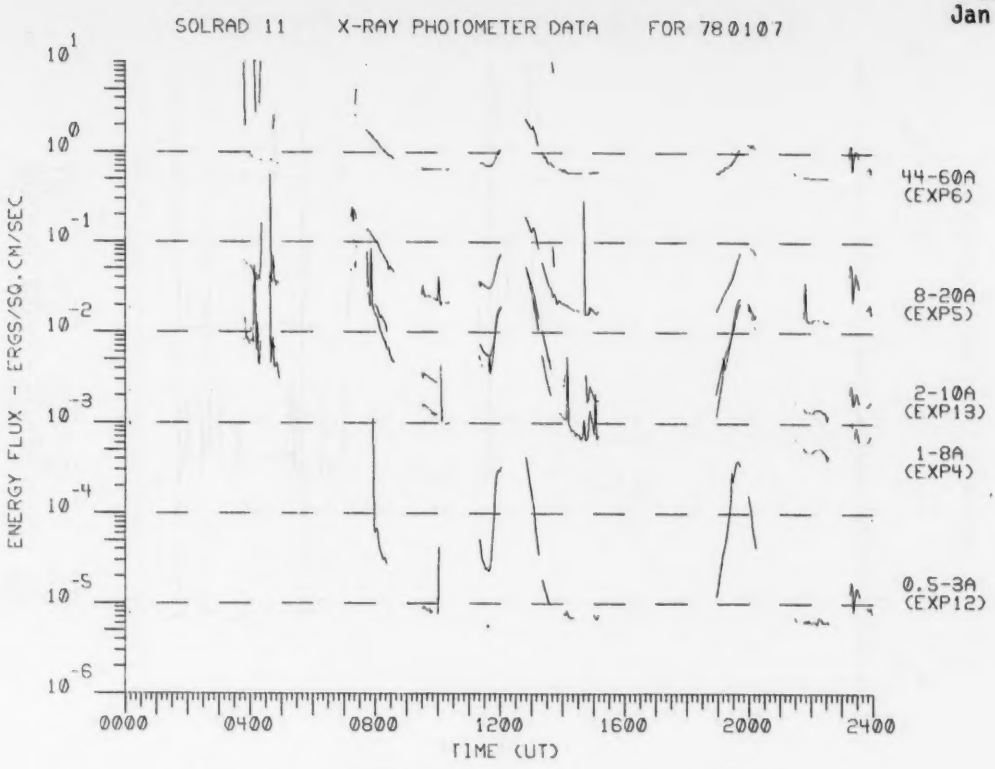

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780104
ENERGY FLUX - ERGS/SQ.CM/SEC
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
10^{-6}
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)

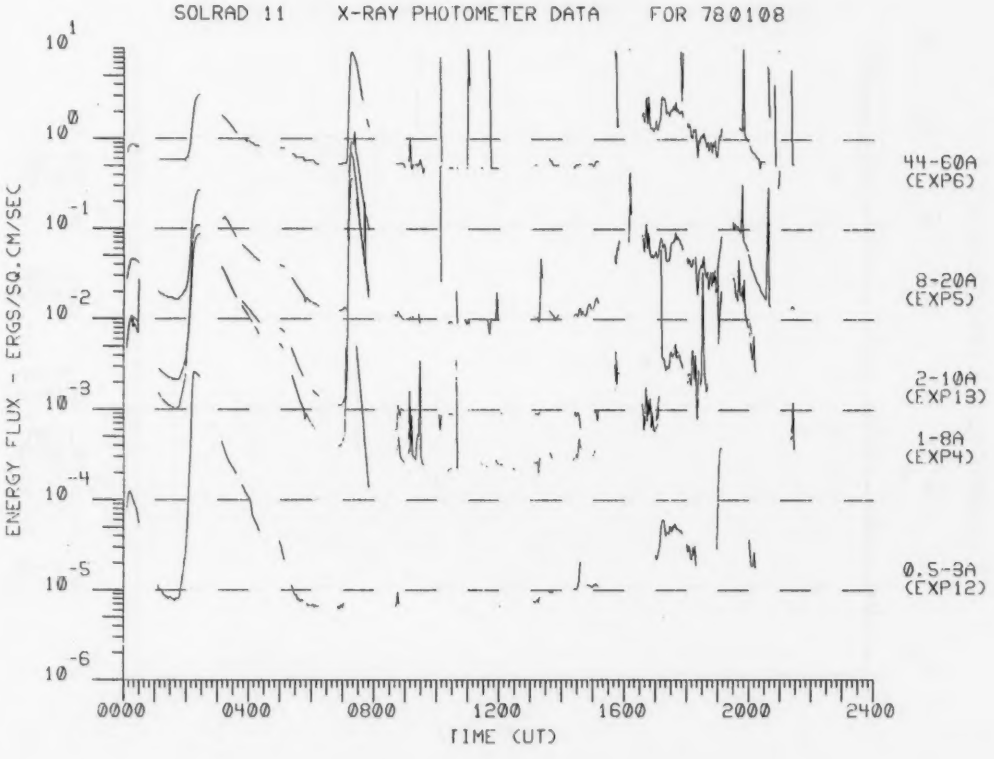
SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780105

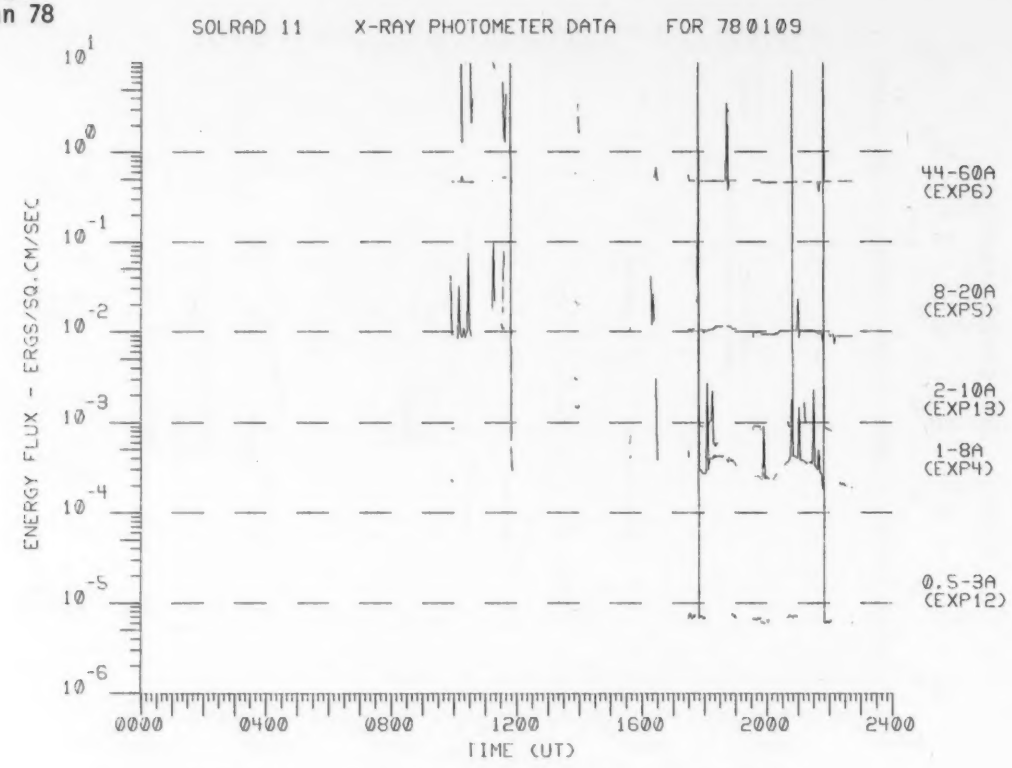


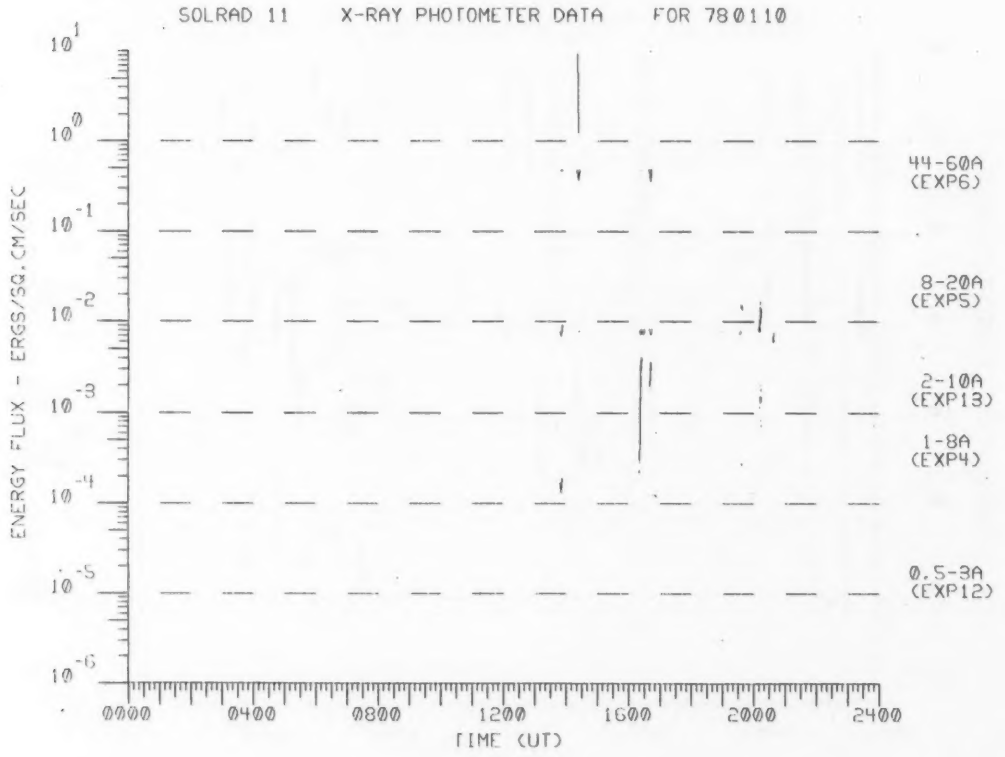
SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780106

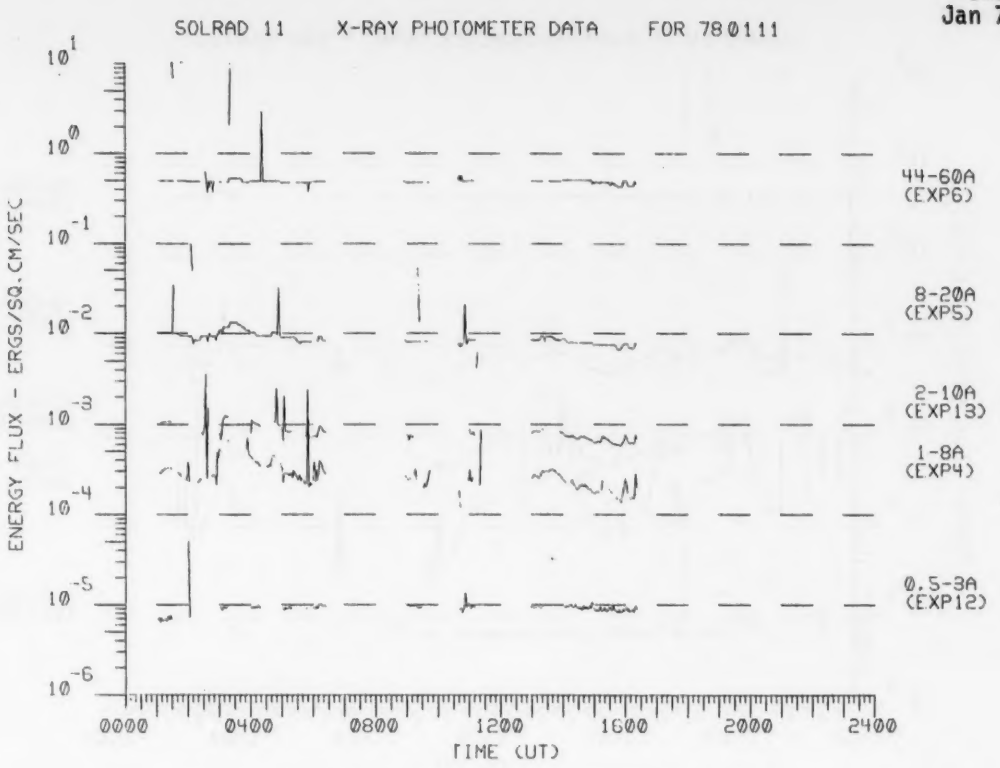


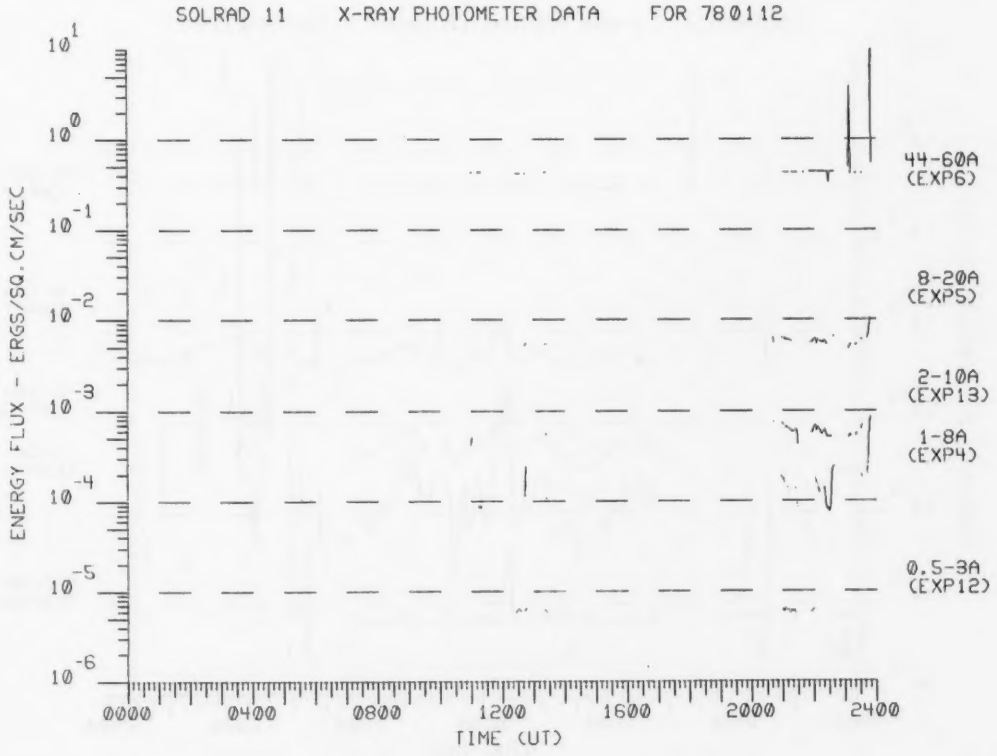

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780107
ENERGY FLUX - ERGS/SQ.CM/SEC
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
10^{-6}
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)


SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780108
ENERGY FLUX - ERGS/SQ.CM/SEC
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
10^{-6}
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)

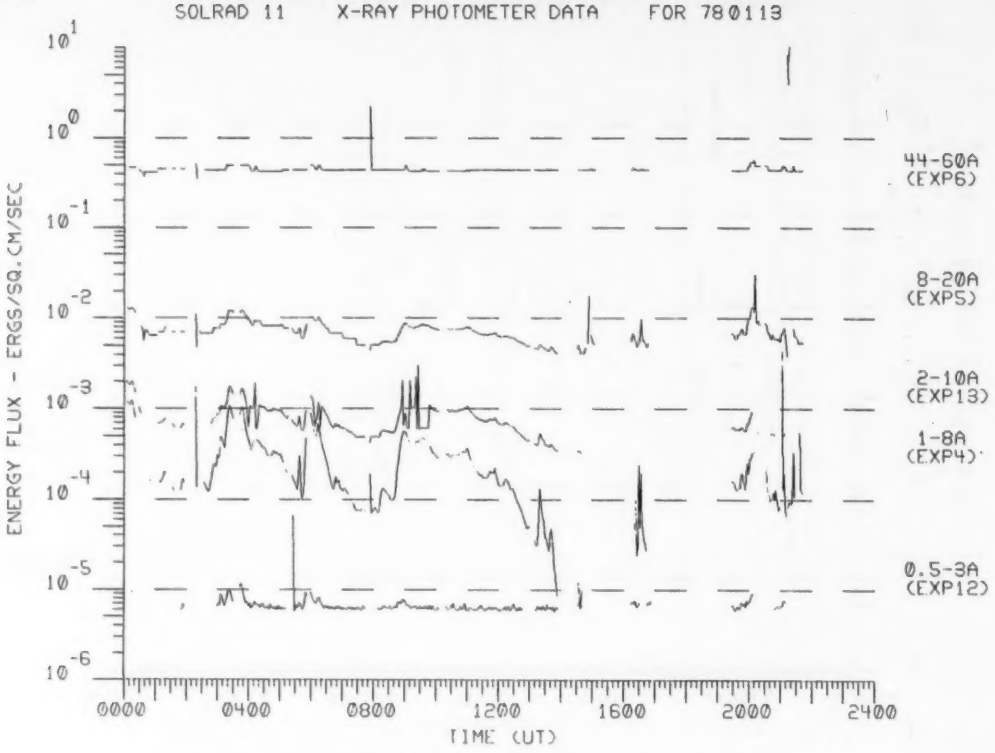

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780109
ENERGY FLUX - ERGS/SQ.CM/SEC
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
10^{-6}
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)


SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780110
ENERGY FLUX - ERGS/SQ.CM/SEC
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
10^{-6}
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)

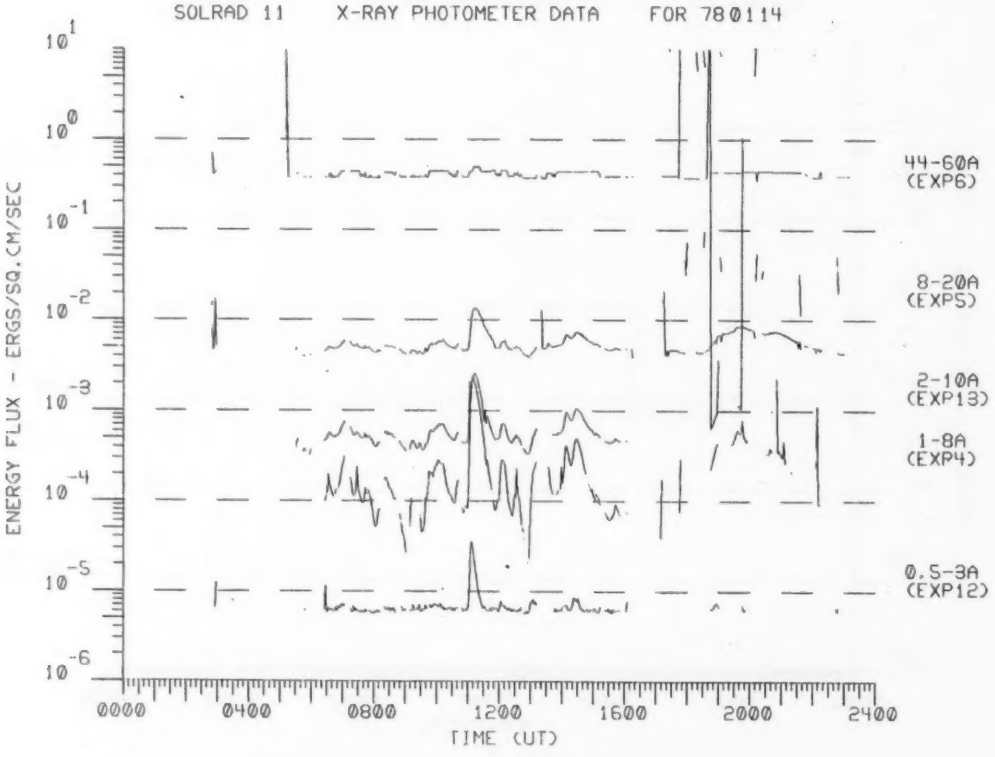

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780111
ENERGY FLUX - ERGS/SQ.CM/SEC
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
10^{-6}
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)

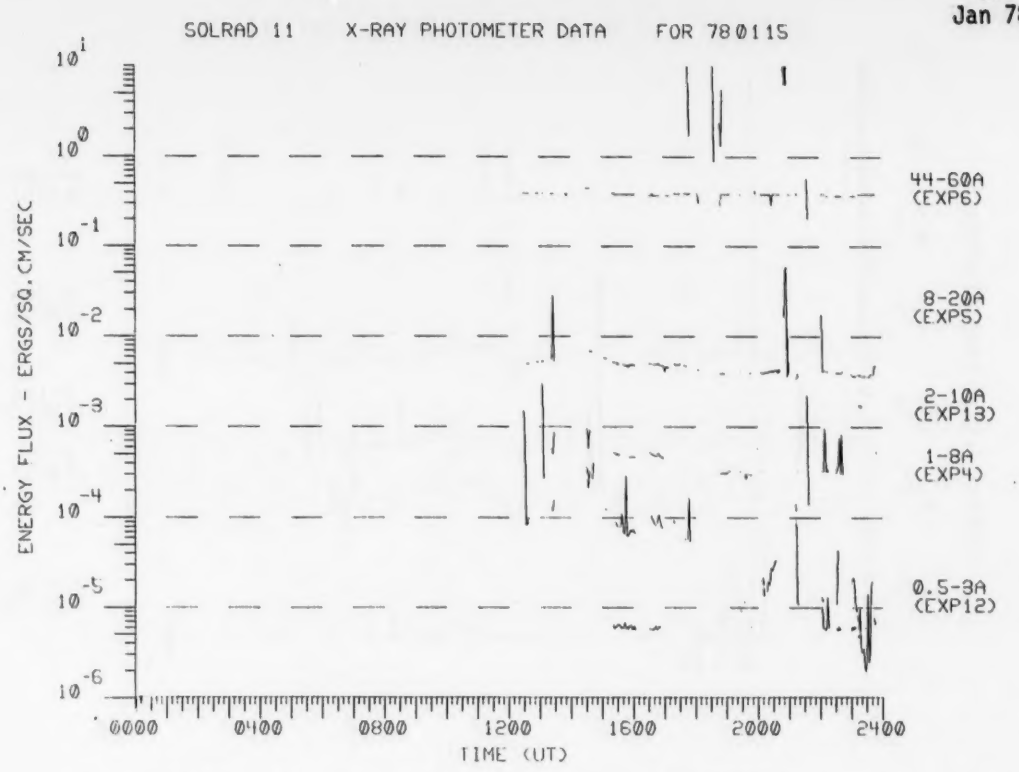

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780112
ENERGY FLUX - ERGS/SQ.CM/SEC
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
10^{-6}
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)

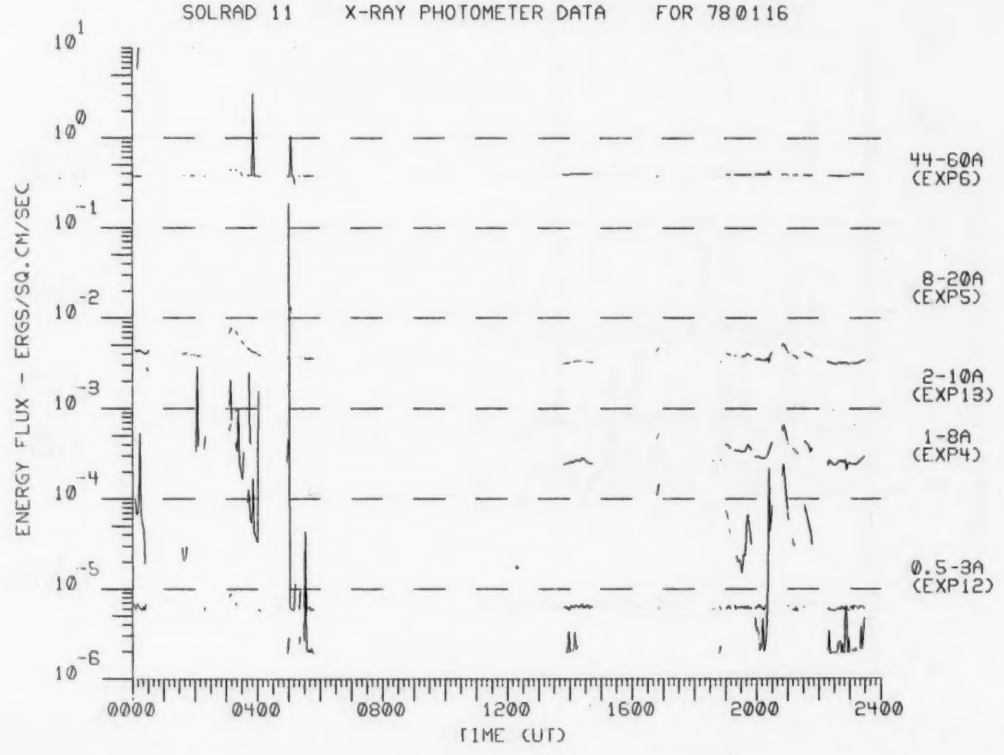
SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780113



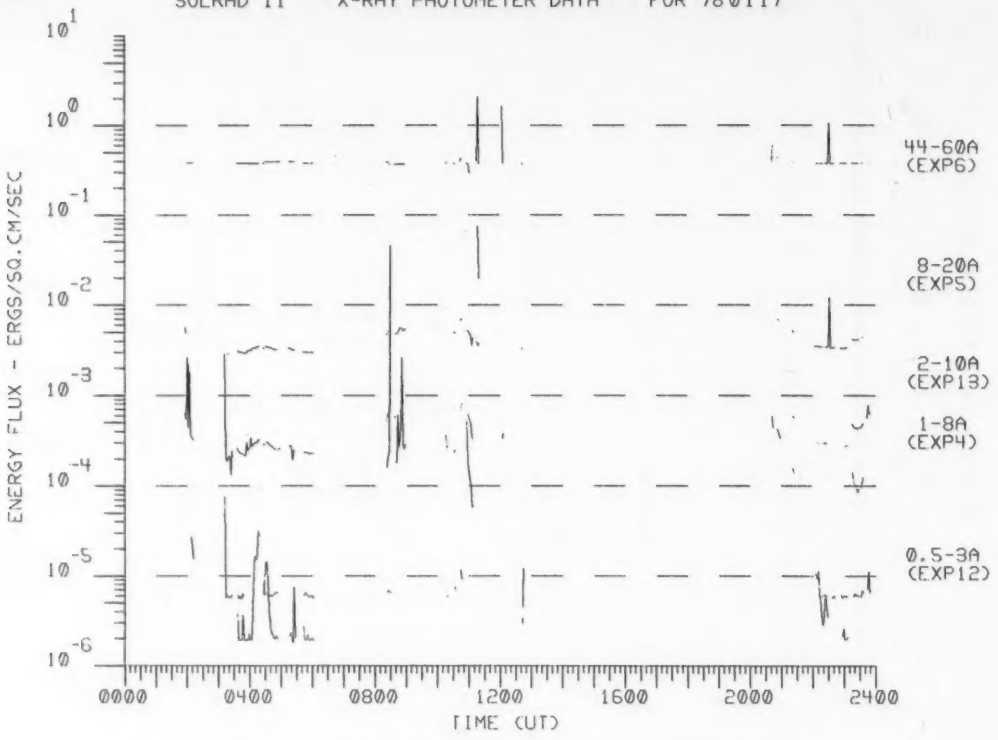
SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780114



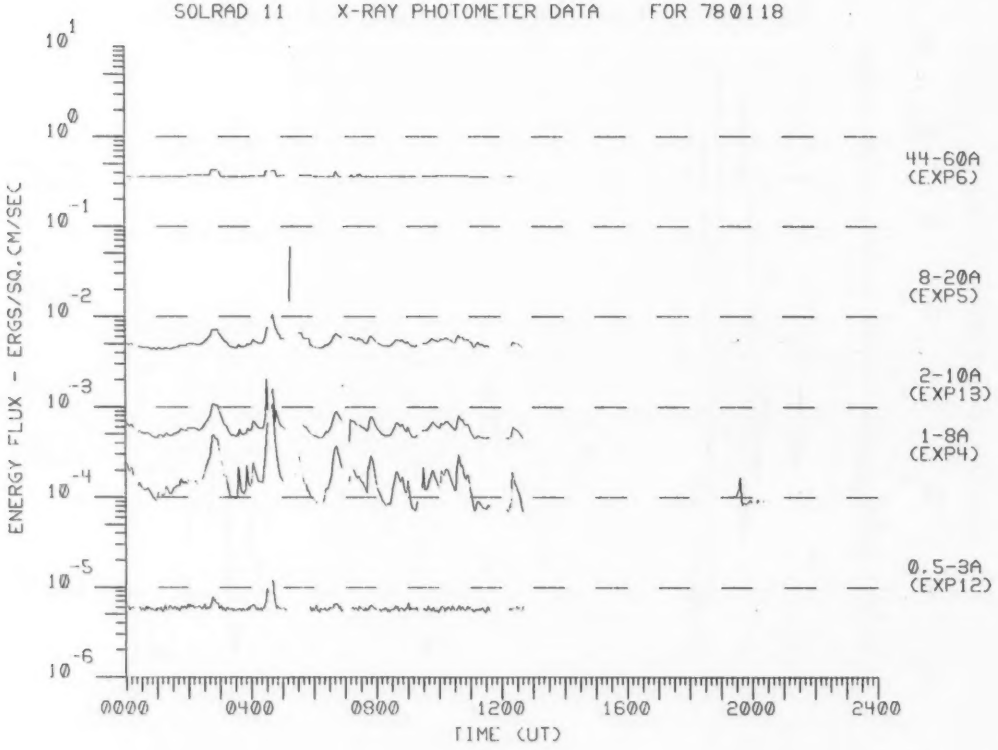

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780115
ENERGY FLUX - ERGS/SQ.CM/SEC
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)

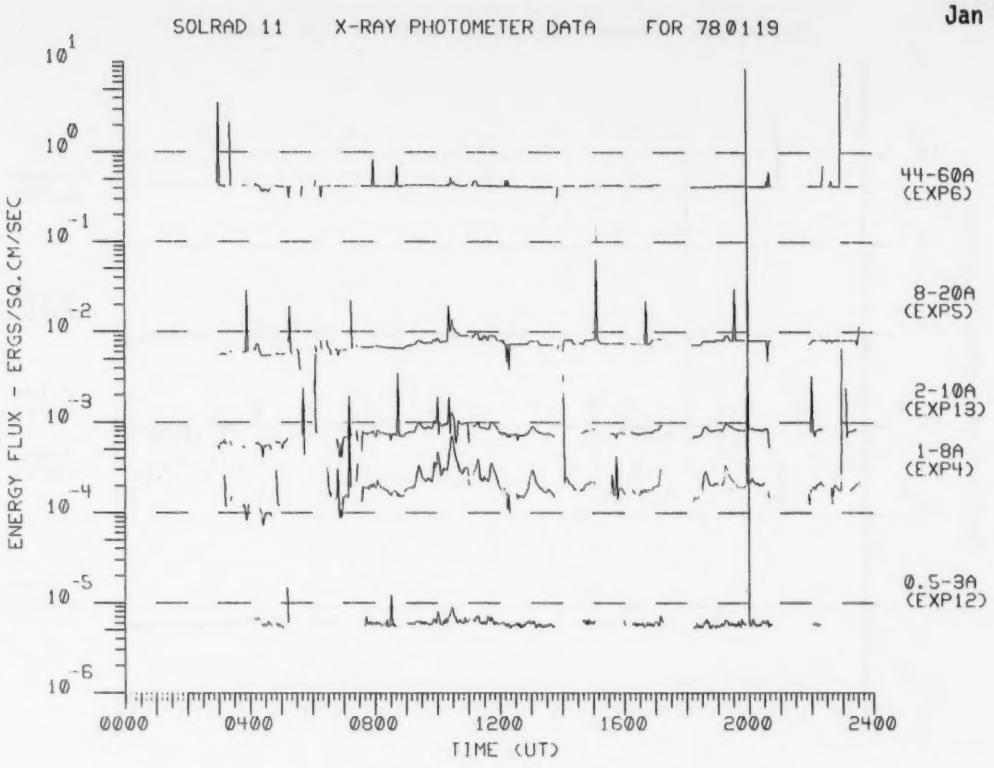

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780116
ENERGY FLUX - ERGS/SQ.CM/SEC
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)

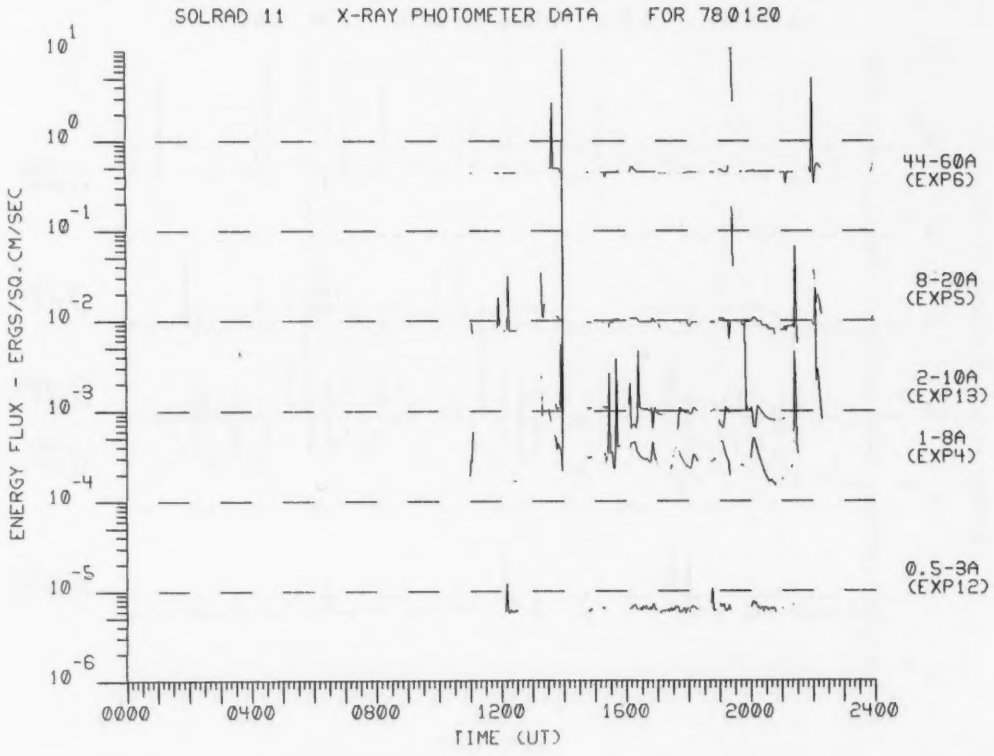
SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780117



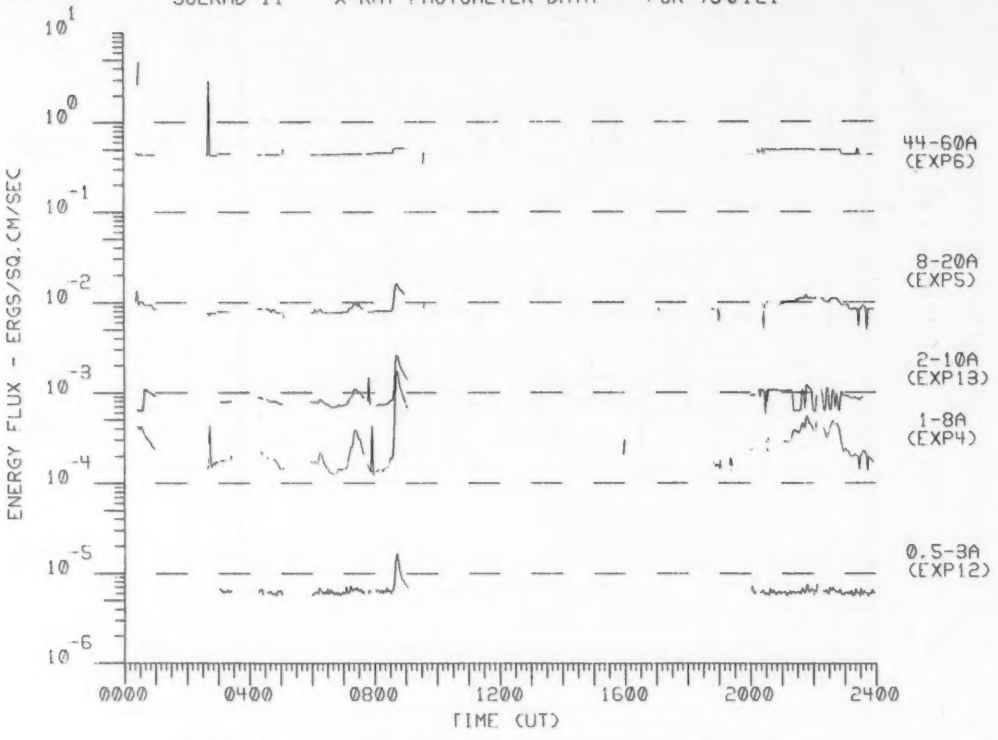
SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780118



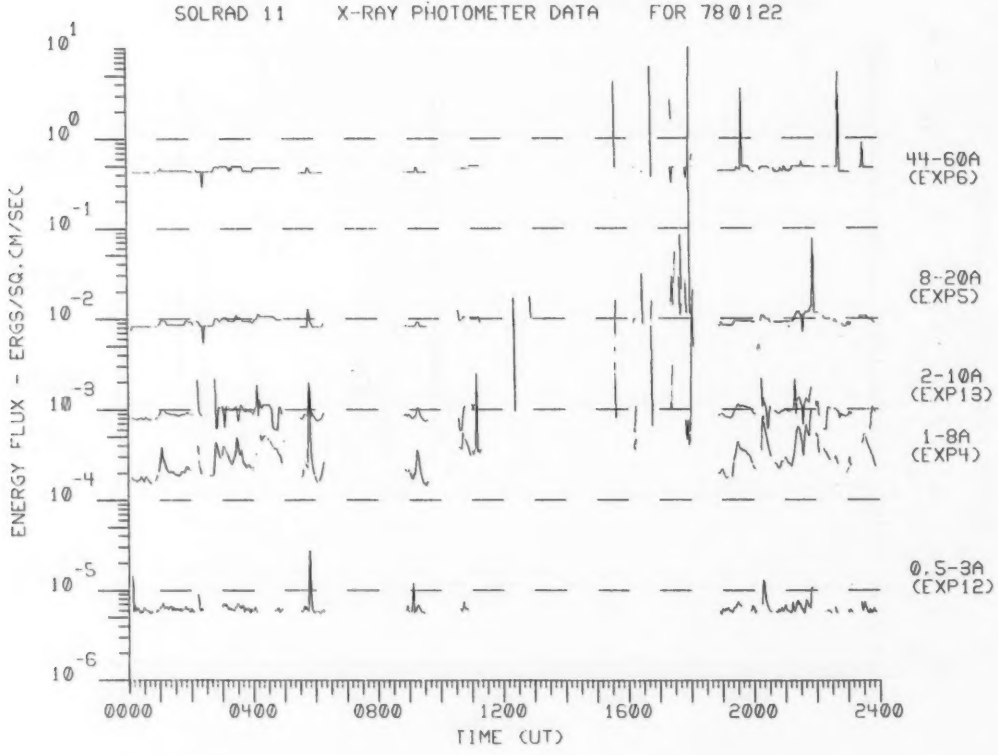

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780119
ENERGY FLUX - ERGS/SQ.CM/SEC
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
10^{-6}
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)


SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780120
ENERGY FLUX - ERGS/SQ.CM/SEC
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
10^{-6}
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)

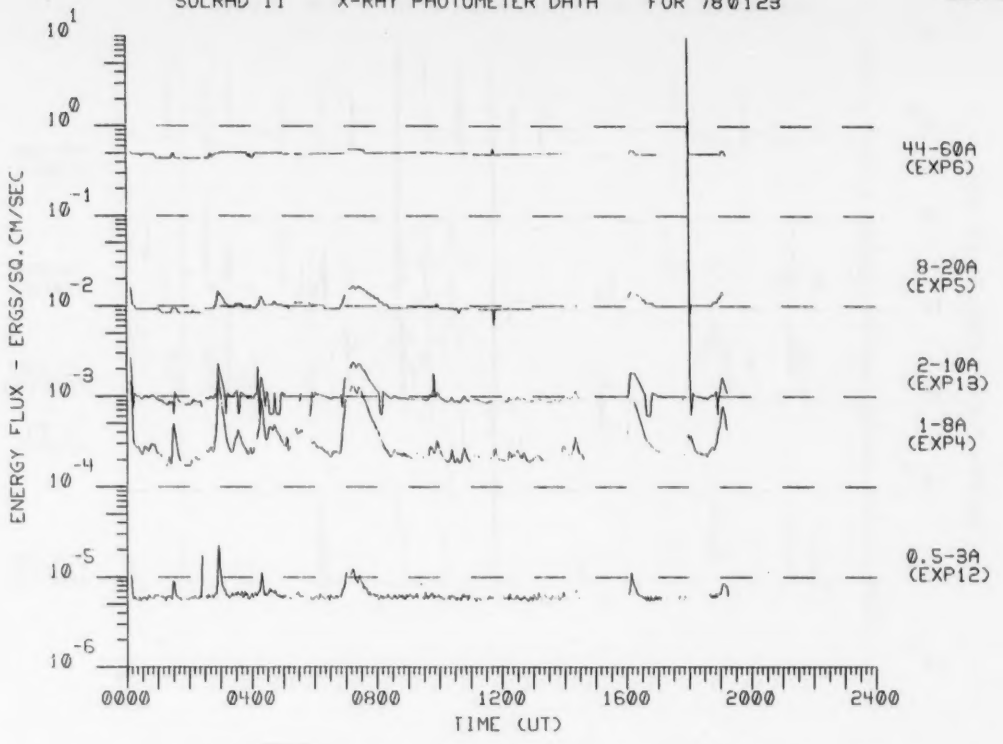
SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780121



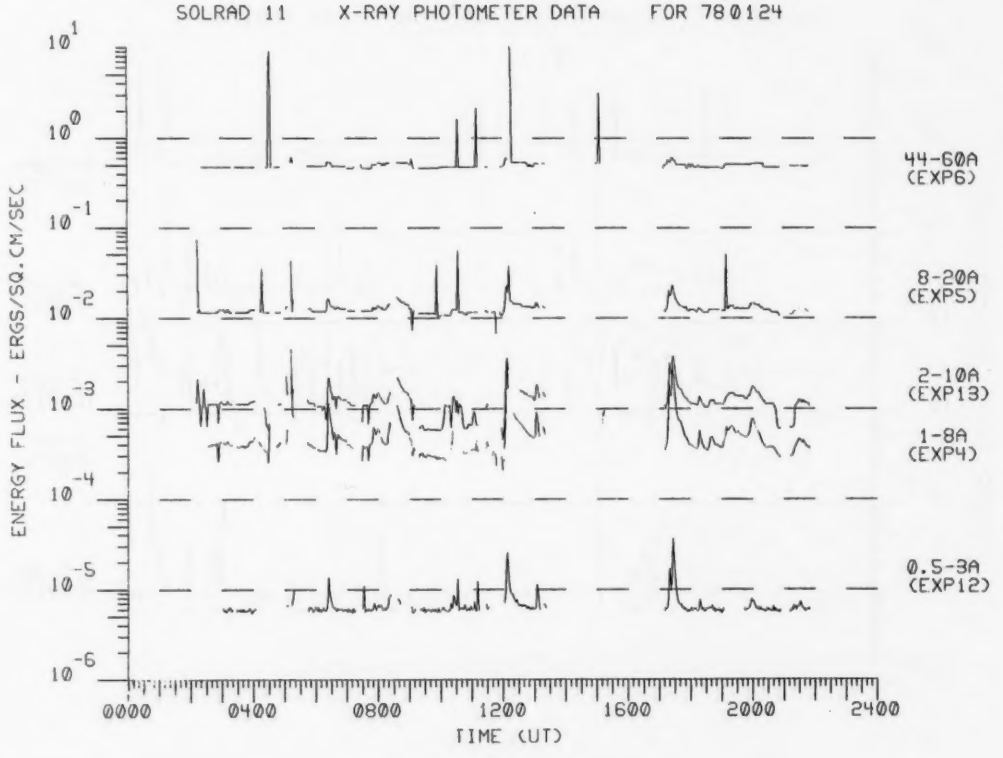
SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780122

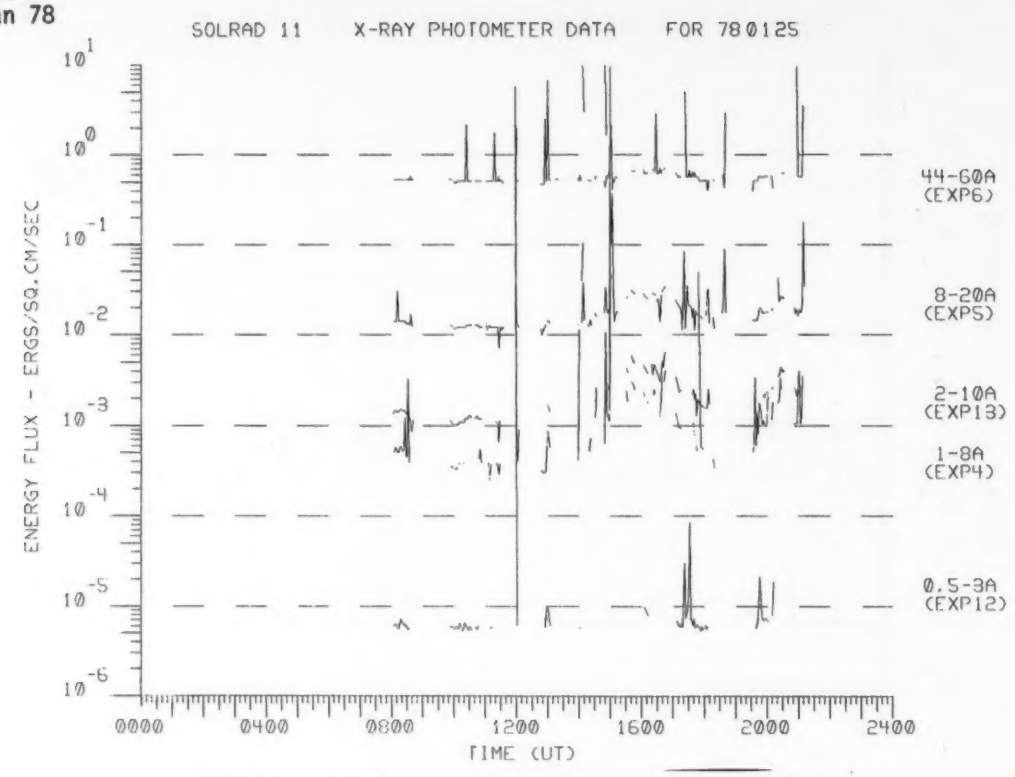


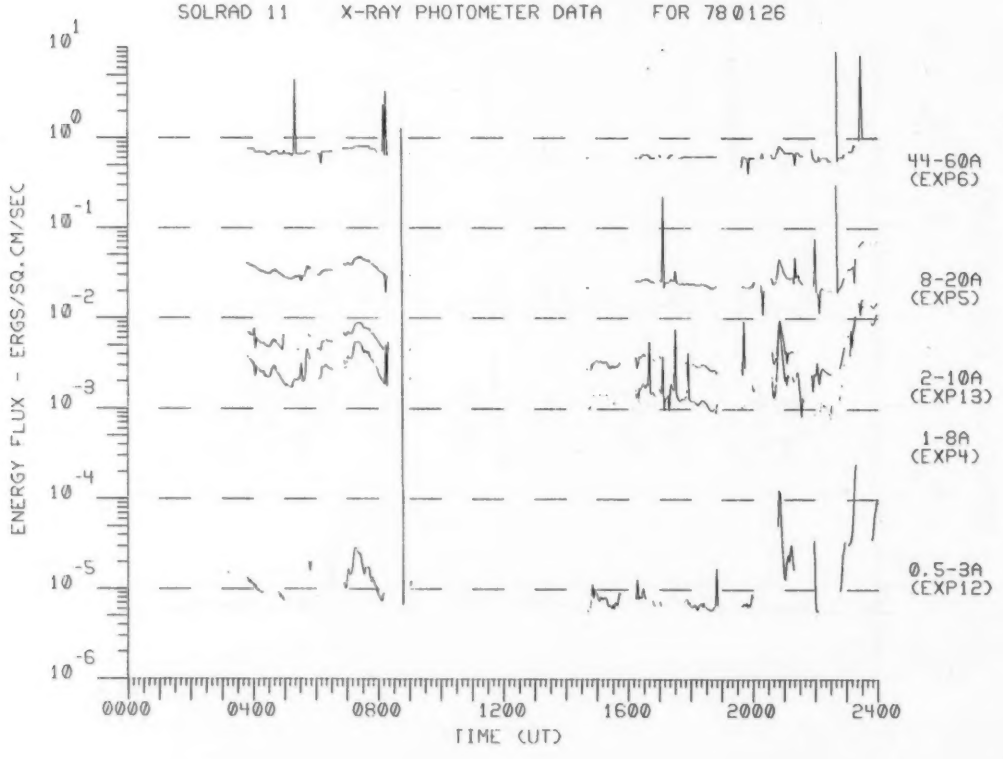
SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780123

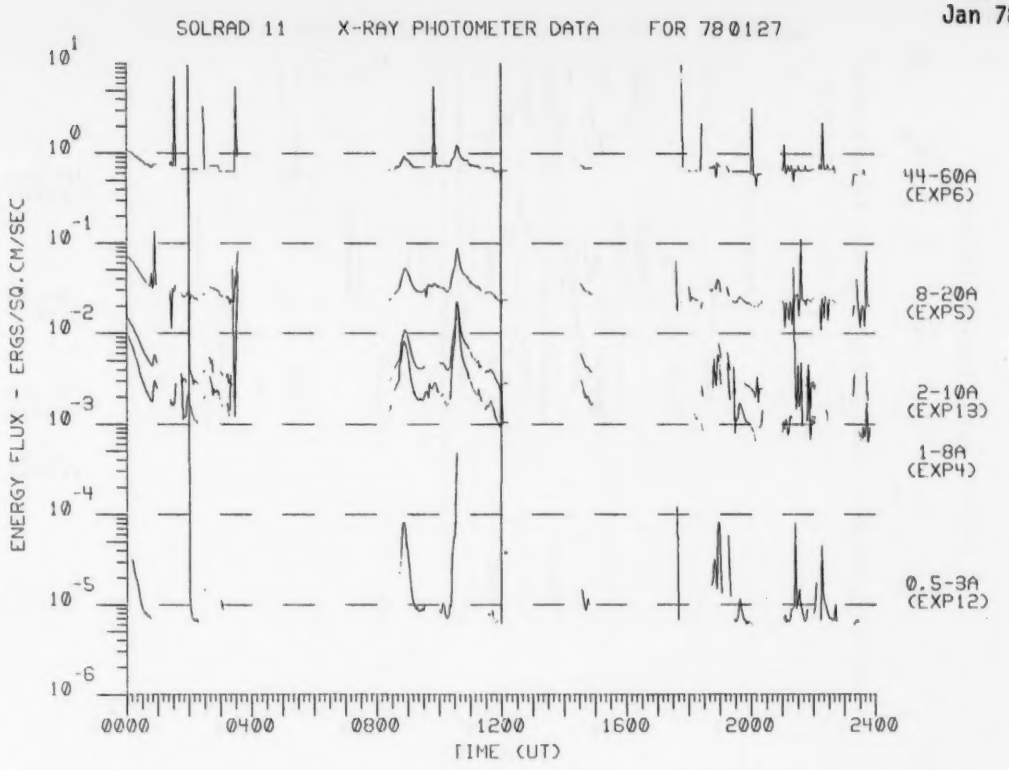


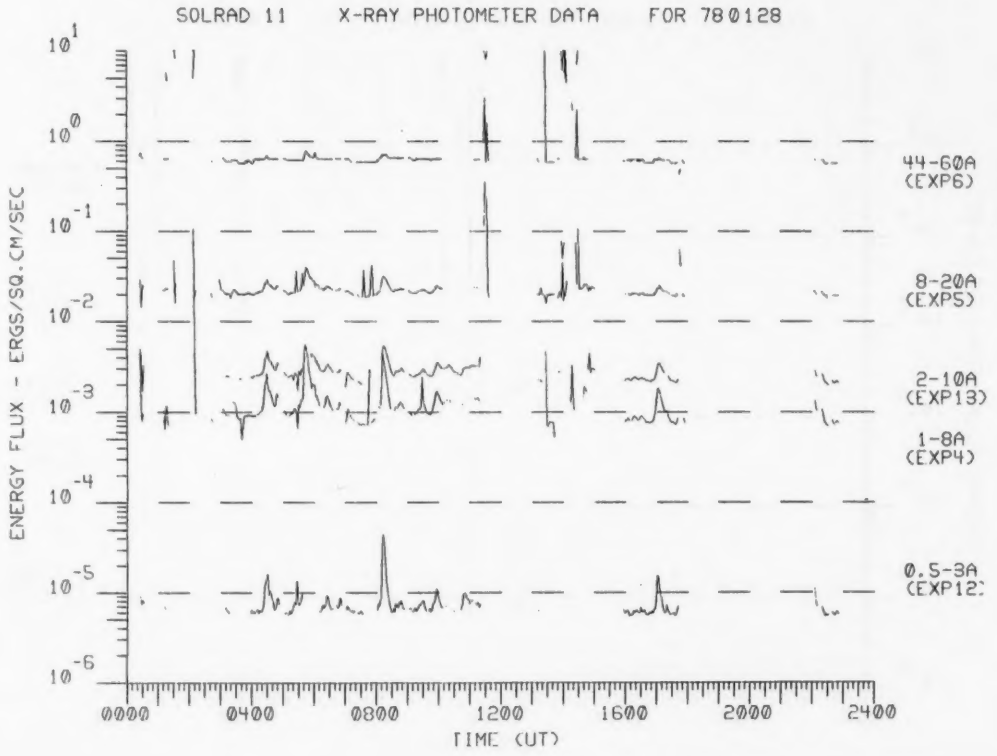
SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780124



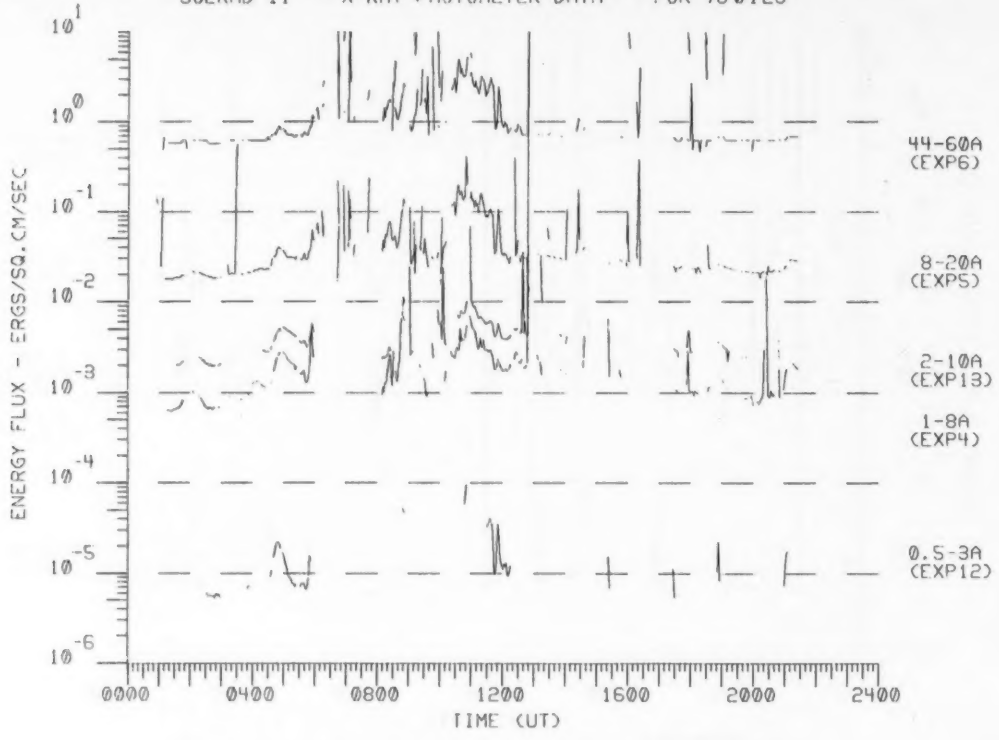

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780125
ENERGY FLUX - ERGS/SQ.CM/SEC
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
10^{-6}
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)


SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780126
ENERGY FLUX - ERGS/SQ.CM/SEC
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
10^{-6}
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)

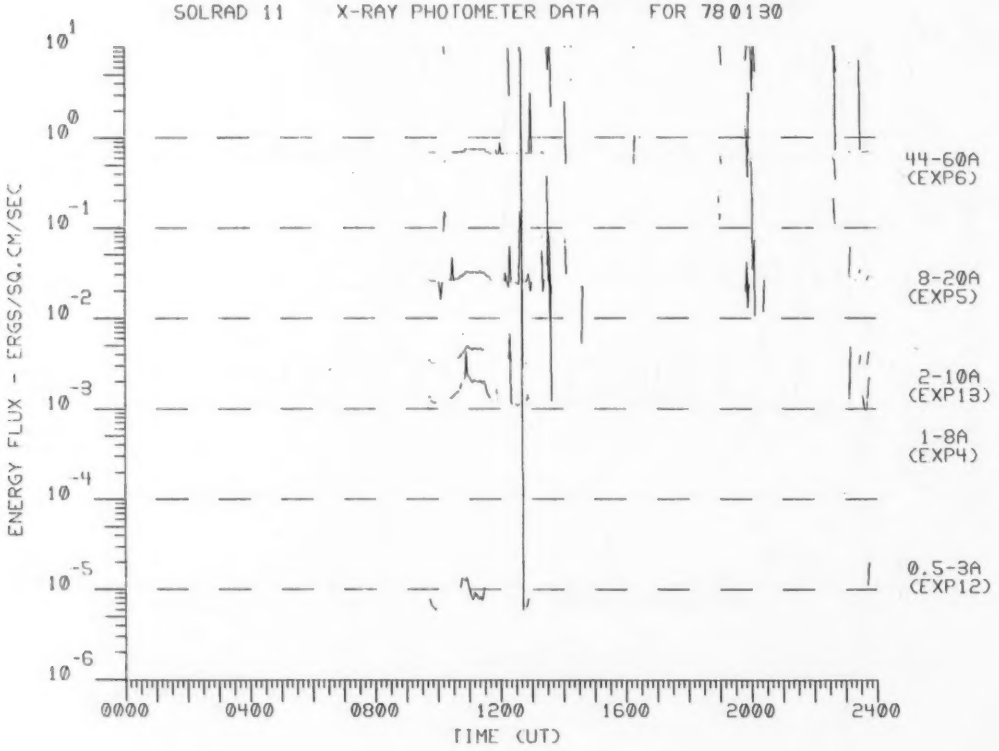

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780127
ENERGY FLUX - ERGS/SQ.CM/SEC
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
10^{-6}
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)

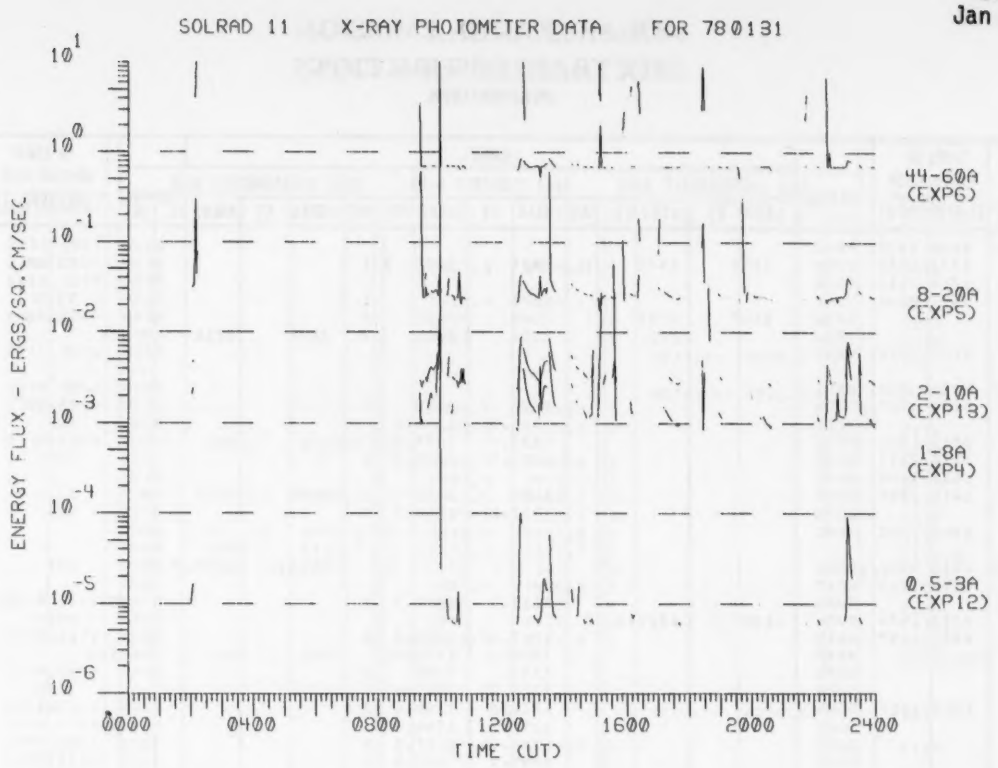

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780128
ENERGY FLUX - ERGS/SQ.CM/SEC
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
10^{-6}
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)

SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780129



SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780130




SOLRAD 11 X-RAY PHOTOMETER DATA FOR 780131
ENERGY FLUX - ERGS/SQ.CM/SEC
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
10^{-6}
44-60A (EXP6)
8-20A (EXP5)
2-10A (EXP13)
1-8A (EXP4)
0.5-3A (EXP12)
0000
0400
0800
1200
1600
2000
2400
TIME (UT)

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JAN 1978	TIMES OF OBSERVATION START UT	TIMES OF OBSERVATION END UT	STATION	EVENTS DECIMETRIC BAND START UT	DECIMETRIC BAND END UT	DECIMETRIC BAND INT	METRIC BAND START UT	METRIC BAND END UT	METRIC BAND INT	DEKAMETRIC BAND START UT	DEKAMETRIC BAND END UT	DEKAMETRIC BAND INT	SPECTRAL TYPE
01	0000	0932	MANI										
	0732	1522	DURN	0800	1522 D	1	0800	1522 D	1				IS,DC
	1218	2116	SGMR										
	1415	2345	HARV				2121		1				IIIB
			HARV	2147	2231	1	2145	2231	2				IIIGG
			HARV				2150	2211	3	2152	2211	3	II
	2153	2400	MANI										
02	0000	0923	MANI										
	0733	1527	DURN				0733 E	1230	2				IS,DC
			WEIS				0814.0	1334.0					IN
	0808	1419	WEIS				0827.0	1458.0					IIIN
	1218	2117	SGMR				1304.9	1720.0	1				CONT
	1437	1456	WEIS										
	1415	2345	HARV				1606	2112	1	1606	2112	1	IIIN
			SGMR				1942.6	1942.8	1				III
	2200	2400	MANI										
03	0000	0927	MANI							0308.6-	0308.9	1	III
	0752	0819	WEIS										
			DURN				1014.6	1109.7	3				IV, P,N,F
	0733	1524	DURN	1016.2	1022.0	2							DCIM
	0931	1457	WEIS				1017.4	1019.8	2				IIIG
			WEIS				1020.5	1026.5					IIH
			DURN				1110	1405	1				IS,C
			DURN				1205.2	1207.4	3				IIIG
	1218	2117	SGMR				1218.0	1256.0	2				CONT
			SGMR				1256.0	1344.0	1				IV
			SGMR				1344.0	2117.0	1				CONT
			WEIS				1445.0	1456.0	2				IIIGG
	1415	2345	HARV				1448	1452	3	1448	1452	3	IIIG
			DURN	1449.8	1450.9	2	1449.8	1450.9	2				IIIG
			HARV				1530	1536	2	1530	1536	2	IIIG
			HARV				1605		2	1605		2	IIIB
			HARV				1618	1620	2	1618	1620	2	IIIG
			HARV				1624	1625	3	1624	1625	3	IIIG
			HARV				1644		3	1644		3	IIIB
			HARV				1653		1	1653		1	IIIB
			HARV				1701	1703	3	1701	1703	3	IIIG
			HARV				1734	1737	3	1734	1737	3	IIIG
			HARV				1838	1839	2	1838	1839	2	IIIG
			HARV				1858	1859	3	1858	1859	3	IIIG
			HARV				1904	1915	1	1904	1915	1	IIIN
			HARV				1956		1	1956		1	IIIB
			HARV				2004		1	2004		1	IIIB
			HARV				2027	2042	2	2027	2042	2	IIIN
			HARV				2144		1	2144		1	IIIG
	2203	2400	MANI										
			HARV				2244		1	2244		1	IIIG
04	0000	0930	MANI							0408.3-	0410.5	2	III
	0755	1458	WEIS				0828.5	0833.3	3				IIIGG
	0734	1524	DURN	0828.8	0830.8	3	0828.8	0830.8	3				IIIGG
	1218	2118	SGMR										
	1415	2345	HARV										
	2218	2400	MANI										
05	0000	0633	MANI										
	0732	0929	MANI										
	0733	1524	DURN										
	0754	1404	WEIS				0919.2	0920.6	1				IIIG
	1218	2118	SGMR										
			WEIS				1230.9	1233.2	2				IIIG
			WEIS				1333.0	1333.6	2				IIIG
			WEIS				1348.5	1348.8					IIIG
	1415	2345	HARV				1431		1				IIIG
	1440	1459	WEIS										
	2206	2400	MANI										
06	0000	0930	MANI							0153.1-	0153.3	1	III

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JAN 1978	TIMES OF OBSERVATION START UT	TIMES OF OBSERVATION END UT	STATION	EVENTS DECIMETRIC BAND START UT	DECIMETRIC BAND END UT	DECIMETRIC BAND INT	METRIC BAND START UT	METRIC BAND END UT	METRIC BAND INT	DEKAMETRIC BAND START UT	DEKAMETRIC BAND END UT	DEKAMETRIC BAND INT	SPECTRAL TYPE
06	0733	1527	DURN										
	0756	1501	WEIS				0915.8	0919.2	1				IIIG
	1218	2119	SGMR										
			WEIS				1405.8	1406.1	1				IIIG
	1415	2345	HARV				1759		2				IIIB
			HARV				2023		1	2023		1	IIIB
	2214	2400	MANI							2338.3-	2338.6	1	III
07	0000	0947	MANI							0210.5-	0315.0	2	CONT
	0754	1504	WEIS				0851.5	0854.5	1				II
			WEIS				0920.0	0920.3	2				IIIG
	0733	1528	DURN	0922.7	0922.7	2							IIIB
			WEIS				0942.7	0942.8	1				IIIB
			WEIS				0957.9	0958.1	2				IIIG
			DURN	0957.9	0958.0	3	0957.9	0958.1	3				IIIG
			WEIS				1025.0	1339.0	3				IIIS
			DURN	1031.0	1031.0	2	1031.0	1031.0	1				IIIG
			DURN	1103.2	1110.7	2	1103.2	1110.7	2				IIIG,N
			DURN	1124	1303	3	1124	1303	3				IV, P,F
			DURN				1515.4	1526.3	2				IIIG,N
	1415	2345	HARV				1526	1527	2				IIIG
			HARV				1844	2137	2	1844	2137	2	I,IIIN
	1219	2121	SGMR				1908.0	2119.0	1				CONT
			HARV	1909	2024	2							IIIN,IVPN
	2219	2400	MANI										
08	0000	0931	MANI							0024.5-	0025.2	1	III
	0732	1528	DURN										
	0754	1242	WEIS				1109.4	1109.7	1				IIIG
	1357	1506	WEIS										
	1415	2345	HARV				1702	1705	1	1702	1705	1	IIIG
			HARV				1719	1724	2	1719	1724	2	IIIG
			HARV				1738	1831	1	1738	1831	1	IIIN
			HARV				1738	2000	1	1738	2000	1	I
	1218	2122	SGMR				1744.8	1745.0	1				III
			SGMR				1807.0	2122.0	1				CONT
			HARV				1852	1913	3	1852	1913	3	IIIGG
			HARV	1903	1931	2							IVN
			HARV				2159		1				IIIG
	2210	2400	MANI										
09	0000	0930	MANI										
	0732	1527	DURN										
	0754	1507	WEIS				0802.2	0802.4	1				IIIB
			WEIS				1129.0	1248.5	3				II
			WEIS				1225.2	1230.5	3				IIIG
	1218	2123	SGMR				1226.1	1230.5	2				V
	1415	2345	HARV										
	2214	2400	MANI										
10	0000	0929	MANI										
	0732	1527	DURN										
	0752	1509	WEIS				0905.5	0906.2	1				IIIG
			WEIS				0911.0	0911.1	1				IIIB
			WEIS				0943.5	0943.7	1				IIIB
	1217	2125	SGMR										
	2210	2410	MANI										
	1415	2345	HARV				2320	2338	1	2335	2338	1	I
			HARV				2324	2336	2	2335	2336	2	II
11	0000	0811	MANI										
	0732	1527	DURN										
	0817	1319	WEIS										
	0846	0930	MANI										
	1217	2126	SGMR										
	1342	1509	WEIS										
	1415	2345	HARV										
	2206	2400	MANI										
12	0000	0317	MANI										

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JAN 1978	TIMES OF OBSERVATION START UT	TIMES OF OBSERVATION END UT	STATION	EVENTS: DECIMETRIC BAND START UT	DECIMETRIC BAND END UT	DECIMETRIC BAND INT	METRIC BAND START UT	METRIC BAND END UT	METRIC BAND INT	DEKAMETRIC BAND START UT	DEKAMETRIC BAND END UT	DEKAMETRIC BAND INT	SPECTRAL TYPE
12	0357	0933	MANI										
	0752	0946	WEIS										
	1217	2127	SGMR				1434.7	1435.1	1				IIIG
	0732	1540	DURN				1535.7	1535.8	3				IIIG
			SGMR				1535.8	1537.0	3				V
	1415	2345	HARV				1536	1541	3	1536	1541	3	IIIG,V
			SGMR				1715.4	1717.0	2				IIIG
			HARV				1715	1717	3	1715	1717	3	IIIGG,V
			HARV				1719	1720	1	1719	1720	1	IIIG
			HARV				1728	1730	3	1728	1730	3	IIIGG
			SGMR				1830.9	2127.0	2				IIIS
			HARV				1831		3	1831		3	IIIB
			HARV				2030	2032	2	2030	2032	2	IIIG,V
	2204	2400	MANI										
13	0000	0928	MANI										
	0732	1540	DURN				0732 E	1023	1				IS
			DURN				1026.8	1027.1	2				IIIG
	1216	2128	SGMR										
	1415	2345	HARV										
	2152	2400	MANI										
14	0000	0937	MANI										
	0732	1540	DURN				0732 E	1540 D	1				IS,DC
	1415	2345	HARV				1420	1440	1				I
			HARV				1554		1	1554		1	IIIB
	1216	2129	SGMR				1743.4	1744.0	1				IIIG
			HARV				1743	1744	3	1743	1744	3	IIIG
			HARV				1849	1904	3	1844	1904	3	IIIGG
			HARV				1918	2210	2	1918	2210	2	IIIN,I
	2208	2400	MANI										
15	0000	0938	MANI										
	0731	1540	DURN				0731 E	1540 D	3				IC,DC
	1215	2130	SGMR										
	1415	2345	HARV										
	2208	2400	MANI										
16	0000	0930	MANI										
	0731	1540	DURN				0907	1540 D	2				I,DC
	1215	2132	SGMR										
	1415	2345	HARV										
	2151	2400	MANI										
17	0000	0938	MANI										
	1214	2134	SGMR				1410.1	1410.8	1				IIIG
	0731	1540	DURN	1410.2	1410.2	1							III,RS
	1415	2345	HARV										
	2142	2400	MANI										
18	0000	0933	MANI										
	0730	1541	DURN										
	1214	2134	SGMR										
	1415	2345	HARV				2128		2	2128		2	IIIB
	2132	2400	MANI										
19	0000	0931	MANI										
	0730	1545	DURN										
	0850	1413	WEIS										
	1213	2135	SGMR										
	1415	2345	HARV										
	1443	1519	WEIS										
	2140	2400	MANI										
20	0000	0934	MANI										
	0729	1548	DURN										
	0746	1521	WEIS										
	1415	2000	HARV										
	2152	2400	MANI										
	2200	2345	HARV										

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JAN 1978	TIMES OF OBSERVATION START UT	TIMES OF OBSERVATION END UT	STATION	EVENTS DECIMETRIC BAND START UT	DECIMETRIC BAND END UT	DECIMETRIC BAND INT	METRIC BAND START UT	METRIC BAND END UT	METRIC BAND INT	DEKAMETRIC BAND START UT	DEKAMETRIC BAND END UT	DEKAMETRIC BAND INT	SPECTRAL TYPE
20			SGMR										
21	0000	0940	MANI										
	0728	1548	DURN										
	0745	1522	WEIS										
	1412	2138	SGMR										
	1415	2345	HARV										
	2216	2400	MANI										
22	0000	0934	MANI										
	0727	1549	DURN										
	0742	1336	WEIS										
	1211	2139	SGMR										
	1351	1524	WEIS										
	1415	2345	HARV										
	2141	2400	MANI										
23	0000	0940	MANI										
	0726	1549	DURN				0726 E	1549 D	1				IS
	0744	1526	WEIS										
	1210	2140	SGMR										
	1415	2345	HARV										
	2138	2400	MANI										
24	0000	0937	MANI										
	0742	1527	WEIS										
	0725	1549	DURN	1202.3	1203.5	1							IIIGG
	1210	2142	SGMR										
	1415	2345	HARV										
	2154	2400	MANI										
25	0000	0933	MANI										
	0725	1549	DURN										
	0739	1134	WEIS										
	1152	1529	WEIS										
	1209	2143	SGMR										
	1401	2345	HARV										
	2134	2400	MANI										
26	0000	0935	MANI										
	0725	1347	DURN										
	0739	1531	WEIS										
	1005	1442	DWIN				1005	1442	1				IN
	1208	2144	SGMR										
	1400	2345	HARV										
	1419	1550	DURN										
	2137	2400	MANI										
27	0000	0935	MANI										
	0724	1550	DURN				0724 E	0830	1				IS
	0735	1536	WEIS				0813.0	0834.0	2				I
	1205	2145	SGMR										
	1400	2330	HARV				1712		1	1712		1	IIIB
			HARV				1756		1	1756		1	IIIB
			HARV				1759		1	1759		1	IIIB
			HARV				1813		1				IIIB
			HARV				1834		1	1834		1	IIIB
			HARV				1838	1839	2	1838	1839	2	IIIG
			HARV				1844		1	1844		1	IIIG
			HARV				1951	1954	2	1951	1954	2	IIIG
	2134	2400	MANI										
28	0000	0016	MANI										
	0040	0600	MANI										
	0629	0938	MANI										
	0734	0901	WEIS										
	0724	1553	DURN				0847	1500	1				IS
	1206	2147	SGMR										
			DURN	1304.7	1305.1	3	1304.7	1305.1	3				IIIG,U
	1333	1538	WEIS				1454.9	1455.3	2				IIIG

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS
JANUARY 1978

JAN 1978	TIMES OF OBSERVATION START UT	TIMES OF OBSERVATION END UT	STATION	EVENTS: DECIMETRIC BAND START UT	DECIMETRIC BAND END UT	DECIMETRIC BAND INT	METRIC BAND START UT	METRIC BAND END UT	METRIC BAND INT	DEKAMETRIC BAND START UT	DEKAMETRIC BAND END UT	DEKAMETRIC BAND INT	SPECTRAL TYPE
28			OURN				1550.5	1550.7	2				IIIG
	1400	2340	HARV				2056		1				IIIG
	2210	2400	MANI										
29	0000	0937	MANI										
	0723	1527	OURN				0723 E	1527 D	2				IS
			OURN				0744.5	0744.7	3				IIIG
			OURN	0830.1	0835.5	1	0830.1	0835.5	3				IIIGG
	0733	1539	WEIS				1013.0	1512.0	2				IS,DC
	1205	2148	SGMR										
	1400	2330	HARV				1716		2	1716		2	IIIG
	2142	2400	MANI										
30	0000	0939	MANI										
	0731	1541	WEIS										
	1204	2149	SGMR										
	1400	2330	HARV										
	2145	2400	MANI										
31	0000	0938	MANI										
	0729	0738	WEIS										
	0722	1554	OURN	0936.7	0942.9	1	0936.7	0942.9	3				IIIGG
	0810	1040	WEIS				0936.8	0937.3	2				IIIG
			WEIS				0939.3	0939.5	3				IIIG
			WEIS				0942.0	0943.0	3				IIIG
			WEIS				1022.8	1029.7	2				IIIG
			OURN	1022.8	1029.7	1	1022.8	1029.7	3				IIIGG
	1057	1543	WEIS										
			OURN				1158.9	1158.9	1				IIIB
	1203	2151	SGMR										
	1400	2345	HARV				1816		1				IIIB
			HARV				1834	1838	2				IIIGG
			HARV				2037		1				IIIG
	2141	2400	MANI										
			MANI							0027.1-	0027.4	1	III
			MANI							0208.5-	0210.6	1	IIIG
			MANI							0335.8-	0336.2	2	III
			MANI							0343.5-	0638.5	3	IV
			MANI							0541.5-	0543.8	1	IIIG
			MANI							0622.8-	0623.4	1	III
			MANI							0829.9-	0831.5	2	III

The symbols used in connection with the spectral type in describing the important bursts are as follows:

B = Single burst
G = Small group (< 10) of bursts
GG = Large group (> 10) of burst
C = Underlying continuum (particularly with type I)
S = Storm in the sense of intermittent but apparently connected activity
N = Intermittent activity in this period
U = U-shaped burst of Type III

RS = Reverse slope burst
DP = Drifting pairs
DC = Drifting Chains
H = Herringbone
W = Weak
P = Pulsations
CONT = Continuum
UNCLF = Unclassified activity

COSMIC RAY INDICES
(Neutron Monitors)
JANUARY 1978

January 1978	THULE Average cts/hr	ALERT Average cts/hr	DEEP RIVER Average cts/hr	CALGARY Average cts/hr	SULPHUR MT Average cts/hr	KIEL Average cts/hr	CLIMAX Average cts/hr	TOKYO Average cts/hr	KULA Average cts/hr
1		7428.4	6948.9			6241.5		3629.7	
2		6056.5	6954.2			6245.8		3633.8	
3		7414.7(29)	6970.3			6264.7		3623.5	
4		7207.7	6720.5			6083.7		3621.7	
5		7184.3	6785.3			6123.0		3642.2	
6		7323.3	6856.6			6164.3		3644.6	
7		7404.1	6924.5			6233.9		3653.3	
8		7404.6	6946.8			6271.1		3654.2	
9		7429.9	6955.5			6278.0		3662.4	
10		7408.3	7003.8			6310.9		3668.8	
11		7437.1	6919.7			6298.7		3658.4	
12		7456.4	6947.3			6291.7		3640.8	
13		7401.9	6957.9			6249.0		3629.3	
14		7482.4	6980.6			6272.2		3630.0	
15		7531.1	7041.5			6344.3		3637.5	
16		7484.5	7065.2			6375.5		3653.0	
17		7465.1	6998.5			6322.0		3644.9	
18		7466.5	6996.1			6304.0		3626.4	
19		7447.6	7002.2			6331.6		3641.7	
20		7464.9	6999.3			6316.4		3641.2	
21		7447.3	7011.2			6312.7		3652.3	
22		7428.8	7001.6			6322.5		3646.8	
23		7401.1	6988.3			6328.6		3639.5	
24		7424.9	6990.5			6349.8		3640.5	
25		7407.6	6964.2			6310.9		3632.2	
26		7385.4	6966.5			6289.3		3621.4	
27		7390.7	6973.9			6290.7		3616.5	
28		7429.3	6947.7			6312.2		3621.0	
29		7356.0	6872.7			6281.1		3619.9	
30		7210.8	6733.9			6137.5		3572.0	
31		7256.6	6777.0			6149.7		3587.2	
MEAN		7356.1	6942.0			6271.2		3635.0	

Data not available at time of publication.

( ) Number of hours for which data are available if less than 24. Number of Section Hours at Climax if sum of both sections is less than 40 hours.

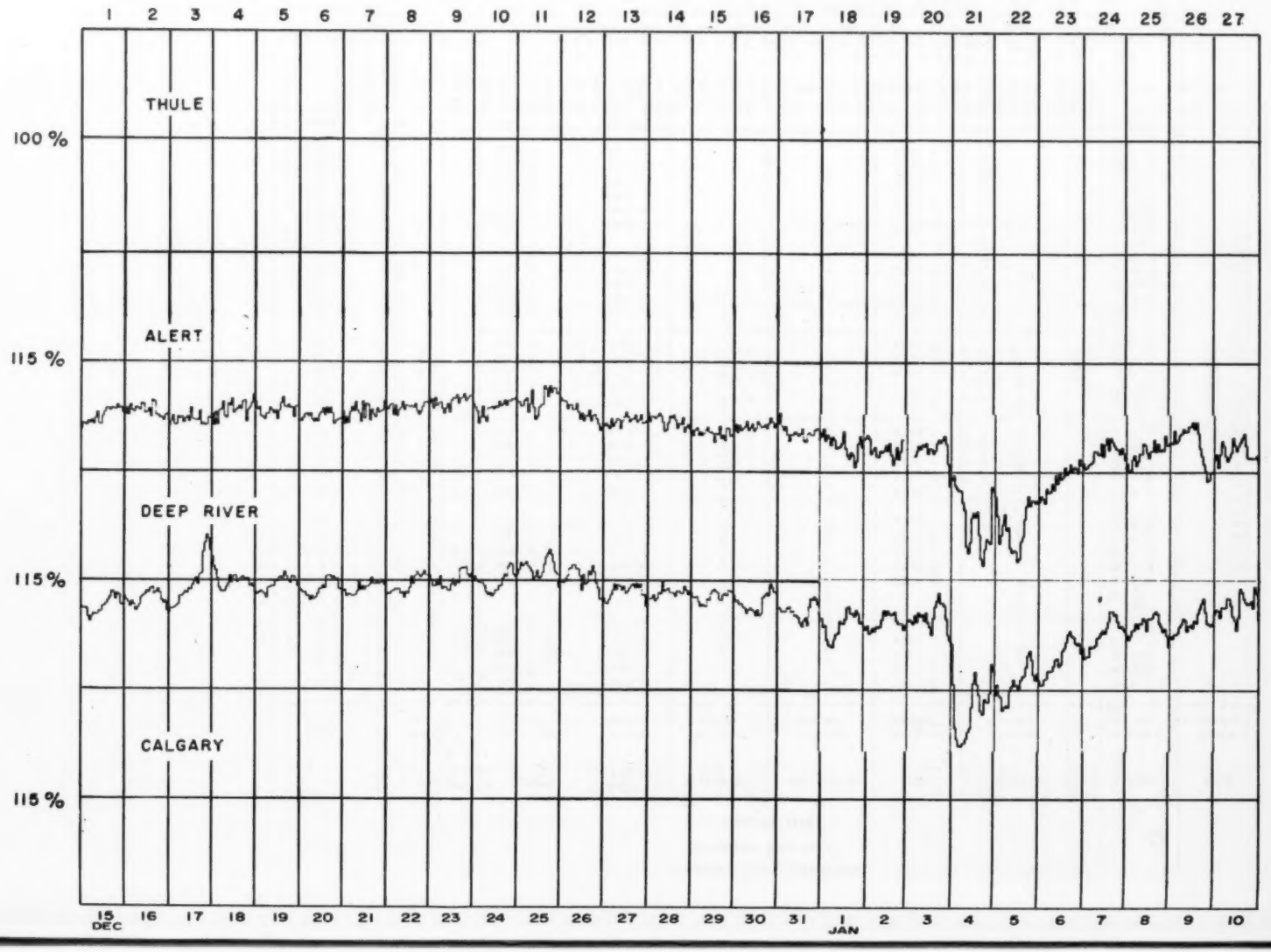
Notes: Tokyo neutron monitor counting rate increased by 2.0/1.5 since the beginning of September 1977. The number of counters changed from 27 to 36. Since the scaling factor has been changed, the listed figures are nearly the same as those in and before May 1977. The level in June, July, and August, 1977 is slightly lower than before. The level in September 1977 has been adjusted, so that direct comparison with the data in and before May, 1977 is possible.

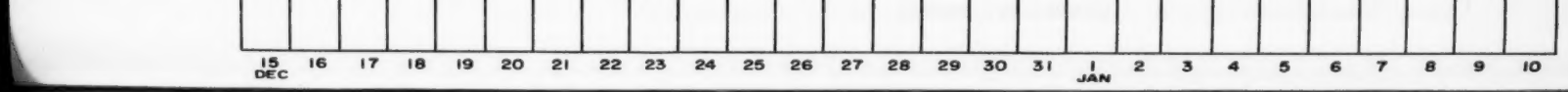
Thule, Alert, Calgary, Sulphur Mountain, Kiel, Climax and Kula Scaling Factors = 100. Deep River Scaling Factor = 300. Tokyo Scaling Factor = 256.

Kula data are available on magnetic tape from the World Data Center A for Solar-Terrestrial Physics. These data include the periods July 1967-December 1970 and October 1975 to the present.

COSMIC RAY INDICES
(Neutron Monitors)

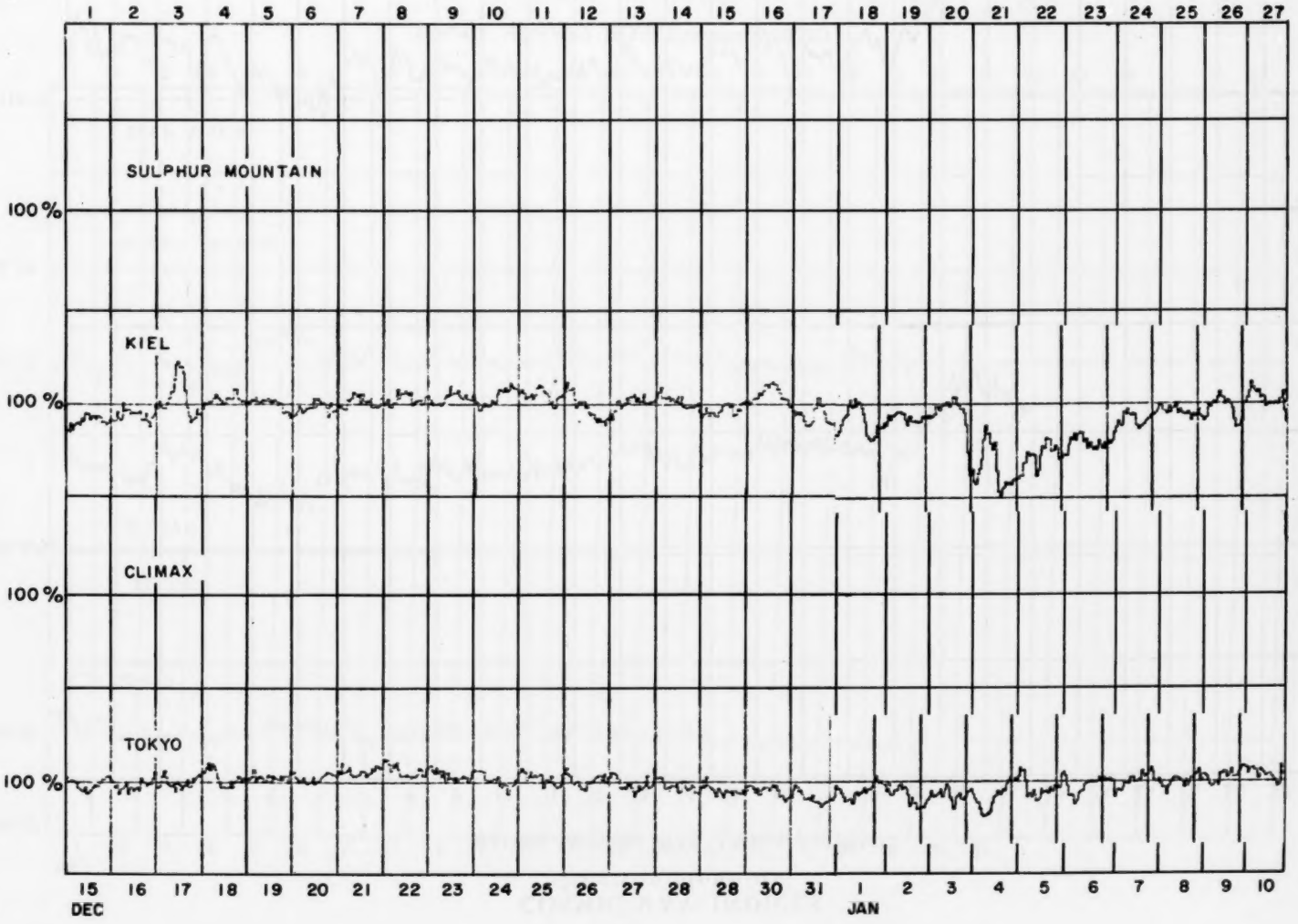
Bartels Rotation 1974 (December 1977 - January 1978)





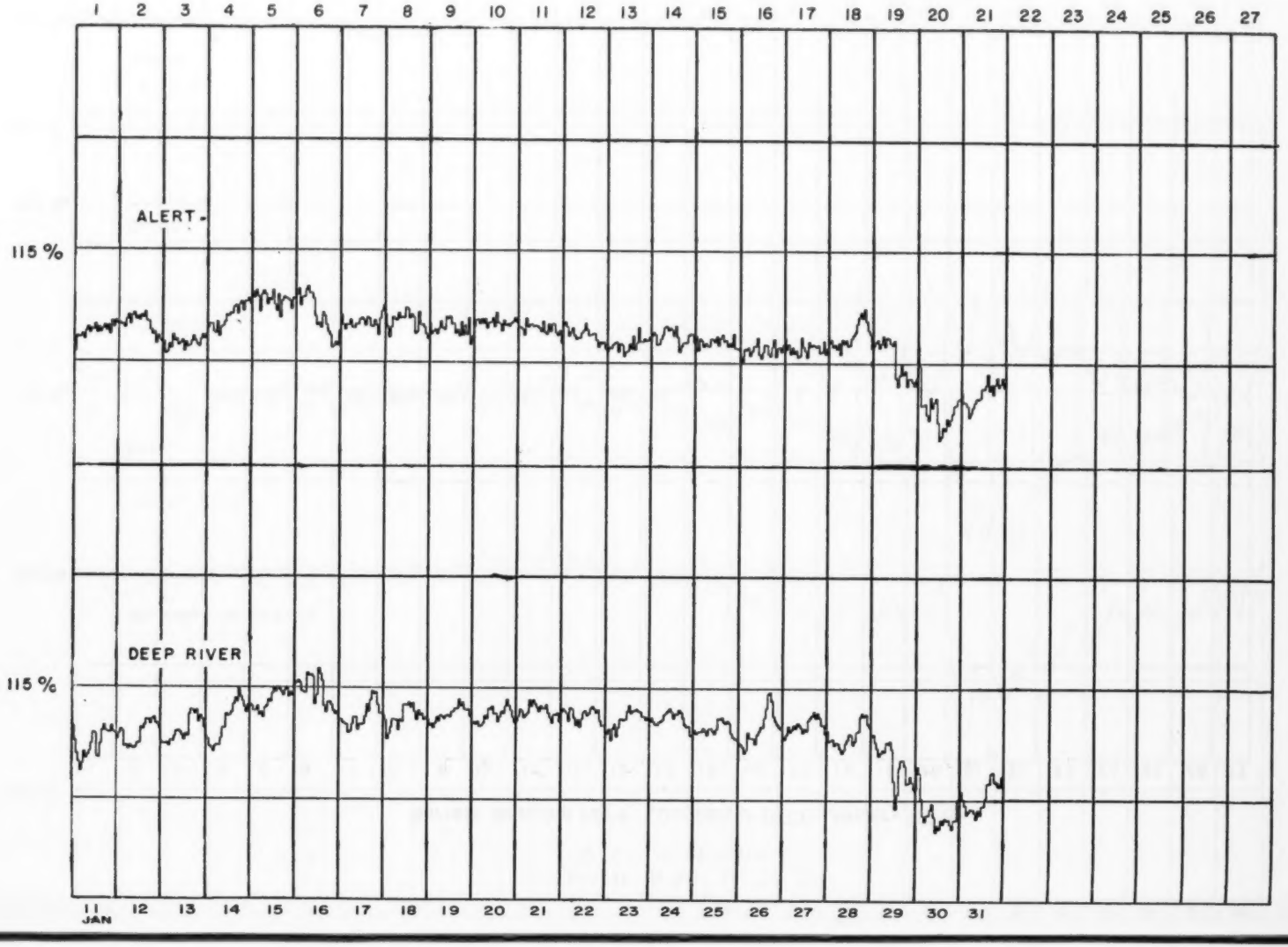
COSMIC RAY INDICES
(Neutron Monitors)

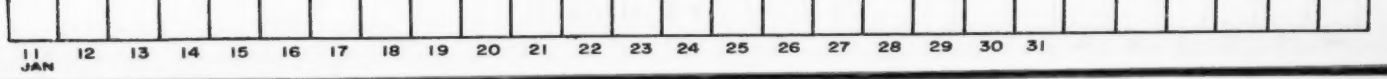
Bartels Rotation 1974 (December 1977 - January 1978)



COSMIC RAY INDICES
(Neutron Monitors)

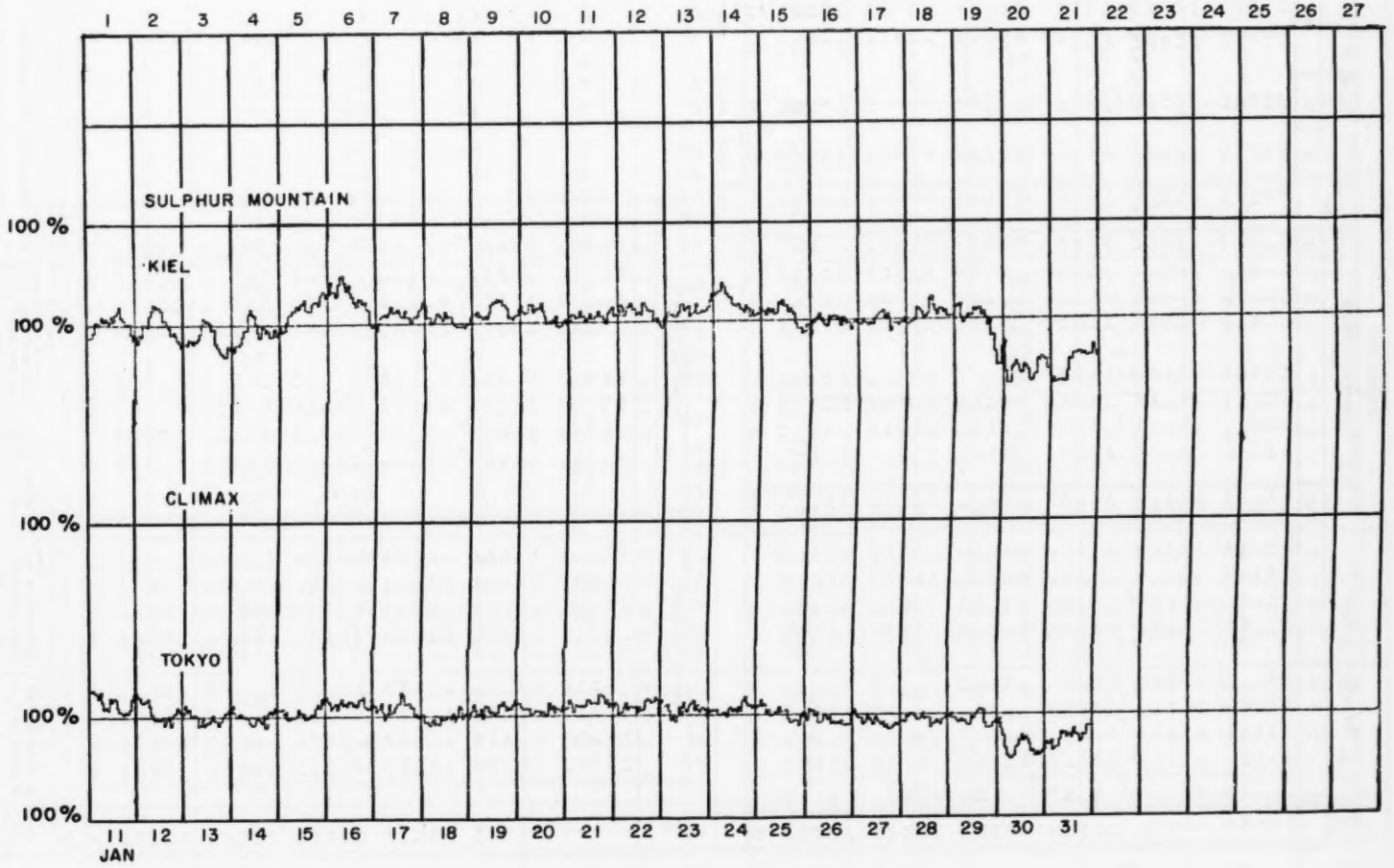
Bartels Rotation 1975 (January 1978)





COSMIC RAY INDICES
(Neutron Monitors)

Bartels Rotation 1975 (January 1978)



GEOMAGNETIC ACTIVITY INDICES

JANUARY 1978

Day		Three-Hourly Indices Kp									Three-Hourly Indices Km								Ap	aa *					Cp
		1	2	3	4	5	6	7	8	Sum	1	2	3	4	5	6	7	8		N	S	M			
1		2-	2	2-	1+	1-	1	3-	3-	14-	1+	2-	2-	1+	1	2-	2+	3-	7	15	11	13	14	C	0.3
2		3	4-	2-	1+	1-	0+	1+	1+	13+	3-	3-	1+	1+	1	1	1	1	5	12	13	17	8	CC	0.4
3		1-	0+	1-	1-	2	3	4-	5	16	1-	0+	1-	1-	2-	3	4-	5-	13	17	20	5	32			0.7
4	D1	5+	6	6-	6	6+	7+	7-	6-	49	5-	5	5-	6-	6	6+	6+	5	89	102	127	87	142			1.8
5	D5	6	6-	4+	3-	3-	3	3-	3+	30+	5	4	4-	2+	3-	3	3	4-	31	40	42	54	27			1.3
6	D4	6	5+	4+	3-	3	3	4	4+	33-	6-	5-	4	3	3	3+	4	4-	34	46	68	73	41			1.3
7		3-	2-	2-	1+	1+	4-	2	5-	19	3-	2+	1+	1+	2-	3	2	4-	13	25	20	14	32			0.7
8		5	3+	3-	3+	3+	3+	2	3-	26-	4	3	3-	3+	4-	3+	2+	2+	19	33	43	44	32			1.0
9		3	3-	4-	3-	2+	5-	4	5	28	2+	2	3-	2+	3-	5-	4	5-	23	48	34	77	55			1.1
10		5	4-	3	2+	2	4	3	4	27	4+	3	3-	2+	2+	4-	3-	3+	21	36	20	24	33			1.1
11		2-	3-	2-	2+	2+	2-	1	1+	15-	2-	2	1+	3-	3-	2-	1	1+	7	10	31	27	14			0.4
12	Q7	1+	2	1-	0+	1-	0+	2-	2-	9-	1-	1+	1-	0+	1	1-	1+	2-	4	7	14	11	11	CC		0.1
13		2-	3	2-	2	2-	2-	2-	3-	16	2-	2	2	2-	2-	2-	2	2+	8	19	4	13	11	CC		0.4
14	Q5	1	0+	2-	1-	0+	0+	0+	2-	6+	1-	0+	1+	0+	1-	0+	0+	1+	3	6	11	8	10	CC		0.1
15	Q3	1-	1	0	1	1-	0	0	0	3+	1-	1-	0+	1+	1+	0+	0	1	2	5	4	7	3	CC		0.0
16		0+	0+	2-	2	4-	4	3+	4+	20-	0	1-	2-	2+	4-	4-	3	3+	14	36	15	9	42			0.8
17		4	3	1	1+	1	1-	1+	3-	15	3-	2+	1+	2-	1+	1	1+	2+	9	18	10	14	10			0.5
18		5-	4-	3-	2	1+	1	0+	1	17-	3+	3-	2+	2	1+	1	1	1+	12	22	11	28	5			0.7
19	Q0	2+	2	2-	2	2	1+	1	2-	14	2	1+	2-	2	2+	2-	1+	1+	6	14	8	13	9	CC		0.3
20	Q6	1-	1-	2	1-	1+	1-	0	0	6	1	1	2-	1	1+	1-	0	0	3	6	3	6	3	CC		0.1
21	Q1	0	0	0	0	0+	0	0+	1	2-	0+	0+	0+	1-	0+	0+	0+	1-	1	4	5	4	5	CC		0.0
22	Q4	1	0+	1	1	1-	0	0+	0+	5-	1	0+	1	1	1+	0+	0+	0+	3	6	6	8	4	CC		0.0
23	Q2	0	0+	0	0	0+	1	1	0+	3	0	1-	1	0+	1-	1+	1+	1-	2	4	5	4	6	CC		0.0
24	Q9K	1-	1-	1+	1	1+	3	2+	1-	11	1	0+	1+	1	1+	3-	2+	1-	6	11	8	5	14	CC		0.3
25		0+	2-	1+	1+	3-	3	3+	4+	16	1	2-	2-	2	3-	3+	3+	4	12	22	19	8	33			0.7
26		5-	3	3-	2+	2	2-	2-	1+	19+	4-	3	2+	2+	2	1+	2-	2-	12	26	20	33	13			0.7
27	Q8	2-	2	1-	1	0+	0+	2	2-	10-	1+	1+	1-	1+	1-	0+	1+	1	5	10	6	9	8	CC		0.2
28		1-	0	1+	1	1+	3-	3+	4-	14	1-	0+	1+	2-	1+	3+	4-	3+	9	20	12	5	28			0.5
29	D2	3+	4+	4	5	5+	6-	4	3	35-	3+	4-	3+	5-	5	5	4-	3	36	50	42	41	52			1.4
30	D3	3-	4	6+	6	3+	2+	3-	5-	32	3	4-	5+	6-	3+	2	3-	4	36	48	51	65	35			1.4
31		4	3+	4-	4-	4-	4	4-	4-	30-	4-	3-	3+	3	4-	4-	4-	3+	23	43	25	27	41			1.1
																			15	24.7	22.8	23.8				0.63

Day	Three-Hourly Indices Kn								Three-Hourly Indices Ks							
	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
1	1+	1+	2-	1	1	2-	2+	3-	2-	2	2-	1+	1	2-	2+	3-
2	3-	3-	1+	1	1-	1-	1-	1-	3	3-	1+	2-	1+	1	1+	1+
3	1-	0	1-	0+	2-	3-	3+	4	1	1-	1	1+	2	3	4+	5-
4	5-	5+	5-	6-	6-	6+	6+	5	5-	5-	4	6-	6+	7-	6+	5
5	5-	4+	4-	2+	2	3	3-	4-	5	4-	4-	2+	3-	3+	3	4
6	6-	5-	4-	3-	3-	3	4-	4-	6-	5-	5-	3+	3+	4-	4	3+
7	2+	2	1+	1+	2-	3	2-	4	3-	2+	1+	1	2-	3	2	4-
8	4	3-	2+	3	3+	3	2	2+	4	3+	3-	3+	4-	4-	3-	2+
9	2+	2-	3+	3	3	5-	4	5-	2+	2+	2	2-	2+	4+	4-	5-
10	4+	3+	2+	2+	2	4-	3-	3+	4	3	3	2	2+	4-	3	3
11	1	2	1+	3-	3-	1+	1-	1	2+	2	2-	3-	2+	2-	1	1+
12	0+	1	0	0	0+	0+	1+	2-	1+	1+	1	1	1+	1	1	2-
13	1+	2+	2+	2+	2	2-	2	2+	2	2-	1+	1	2-	2-	2-	2
14	0+	0+	1+	0+	0	0	0	1+	1	1-	1	1-	1	1	1	2-
15	1-	0+	0	1+	1+	0+	0	0+	1	1	1-	1+	1+	0+	0	1+
16	0	0	2-	2-	4	3+	3	3+	0+	1	2	3-	4-	4-	3	3+
17	3	2+	1	1+	1+	1	1	3-	2+	2+	1+	2	1	1-	2-	2+
18	4-	3-	2+	2	2-	1	0+	1-	3+	3	2+	2	1+	1+	2-	2-
19	2	1+	2	2	2-	2	1+	1+	2	1	2-	2	3-	1+	1	1
20	1-	1-	2	1-	1+	1-	0	0	1+	1+	1+	1+	2-	1-	0+	0
21	0	0	0	0+	0	0	0	1-	0+	1-	1-	1	1-	1-	0+	1-
22	1	0	1	1	1	0	0+	0	1+	1-	1	1	2-	1-	0+	0+
23	0	1-	0+	0	0+	1+	1	0	0	1	1+	1-	1-	1+	1+	1
24	1-	0+	1+	1	2-	3	2+	0	1	0+	1+	1	1+	3-	2	1
25	0	1+	2-	2+	3-	3	3+	4-	1+	2	2-	2-	3-	4-	4-	4+
26	4-	2+	2+	3-	2-	1+	2-	1+	4-	3+	2+	2-	2	1+	2	2
27	1+	2-	0+	1+	0+	0+	1+	1	1+	1+	1	1	1+	0+	2-	1+
28	0+	0	1+	2-	1	3	3+	3	1-	1-	1+	1+	1+	3+	4-	3+
29	3-	4-	3+	5	5	5	4-	3-	4-	3+	3	4	5-	5	4-	3
30	3-	3+	5+	6-	3+	2	3-	4-	4-	4-	5	5+	4-	2	3-	4
31	3+	3-	3	3+	4-	4-	3+	3	4	3	3+	3	4-	4	4-	4

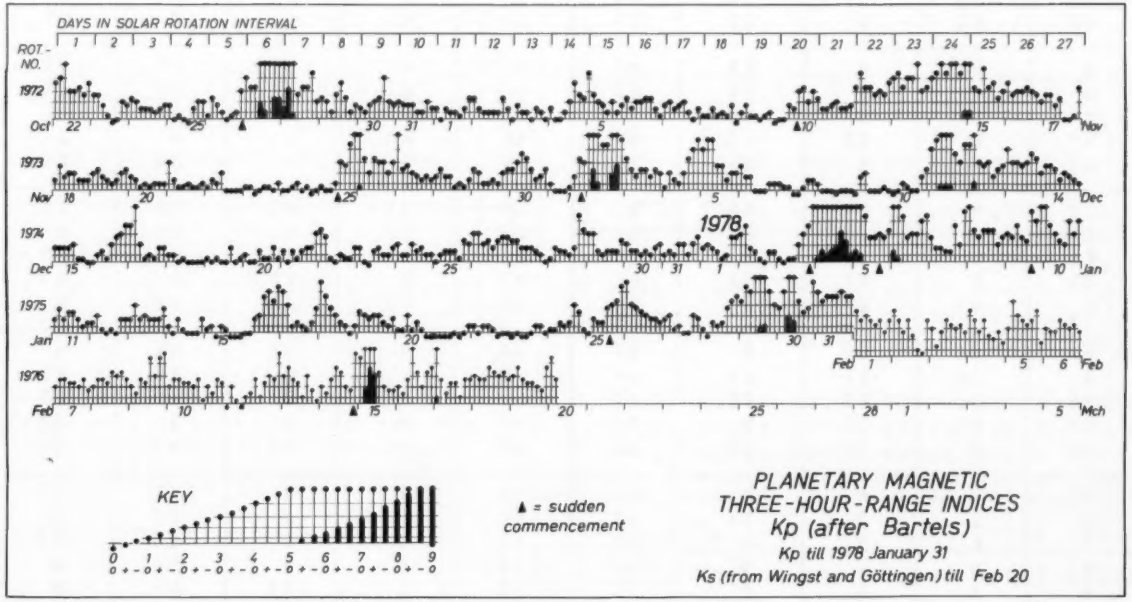
Quiet days (Q) and disturbed days (D), geomagnetic planetary three-hour-range indices (Kp) (integers alone are equivalent to those normally given with a small zero), magnetic character figures (Cp), and average amplitude (Ap) (unit 2γ) prepared by Geophysikalisches Institut at the University of Göttingen, F.R. of Germany for the International Service of Geomagnetic Indices. Ten most quiet days [Q1-Q0(10)] and five most disturbed days [D1-D5] are ordered from most quiet or disturbed, respectively. A or K means "not really quiet" (A = "Ap>6", K = "Ap ≤6 but one Kp ≥3o or two Kp values ≥3-"). An * means "not really disturbed" (Ap<20).

Geomagnetic three-hourly indices (Kn), (Ks) and (Km) as in IAGA-Bulletin No. 32 and indices (aa), "antipodal", as in IAGA-Bulletin No. 33 prepared by P. N. Mayaud of the Institut de Physique du Globe, Paris, France. Really quiet (C) and quiet but slightly disturbed three-hourly intervals (K) are given for 24-hour and 48-hour intervals centered on 12 UT.

DAILY AVERAGE INDICES Ap

	1977											1978
DAY	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN
1	7	11	4	13	9	15	6	4	4	5	6	7
2	21	5	5	66	14	11	4	6	5	6	69	8
3	11	4	12	15	6	9	7	8	10	4	9	13
4	4	3	24	19	5	8	9	6	7	8	14	89
5	9	4	12	11	7	5	40	3	8	10	18	31
6	14	6	49	10	5	28	21	4	8	7	5	34
7	18	5	48	6	6	15	17	6	3	5	3	13
8	18	12	27	3	6	14	12	8	6	3	2	19
9	25	38	22	7	6	16	20	11	2	3	3	23
10	12	19	13	9	8	14	12	13	4	9	4	21
11	13	18	14	24	4	10	28	19	12	6	38	7
12	7	22	8	19	4	4	11	6	28	18	21	4
13	12	13	5	6	6	9	11	28	14	26	16	8
14	11	12	12	8	9	18	12	10	13	42	8	3
15	8	5	10	14	3	12	11	9	19	25	5	2
16	6	6	17	22	10	27	9	7	8	14	9	14
17	9	9	9	18	8	14	29	10	12	8	12	9
18	17	11	8	11	10	7	13	6	22	6	3	12
19	6	5	48	5	10	23	24	42	28	6	3	6
20	5	13	28	10	11	29	8	44	7	4	4	3
21	7	10	12	4	6	10	5	64	5	5	6	1
22	8	7	6	7	10	11	5	63	22	3	6	3
23	18	14	5	7	10	6	6	21	6	2	4	2
24	14	12	11	8	7	7	10	12	6	2	5	6
25	11	12	22	5	5	5	27	10	4	15	5	12
26	8	16	4	2	6	3	13	18	6	19	11	12
27	3	8	4	4	7	3	14	24	62	12	6	5
28	7	15	4	7	12	4	7	9	47	5	10	9
29		14	18	2	7	61	6	3	9	6	8	36
30		5	8	5	9	17	5	4	9	12	5	36
31		4		7		8	4		6		6	23
MEAN	11	11	16	11	8	14	13	16	13	10	10	15

GEOMAGNETIC ACTIVITY INDICES



PRINCIPAL MAGNETIC STORMS

JANUARY 1978

OBS. 2 letter IAGA code	GEOMAG-NETIC LATI-TUDE	COMMENCEMENT DAY	hr min (UT)	TYPE	SC - AMPLITUDES D(')	H(γ)	Z(γ)	MAXIMUM 3 HOUR - INDEX K DAY(3 HOUR PERIOD)	K	RANGES D(')	H(γ)	Z(γ)	UT END DAY	HOUR
CO	64.6N	3	11--	..	..	..	..	04(4,6)	8	556	2640	1600	06	08
SI	60.0N	3	11--	..	..	..	..	04(5)	8	--	--	800	07	00
NE	55.1N	3	2042	SC*	2	18	--	04(4,5)	7	58	403	439	05	15
WI	54.2N	3	2043	SC*	+ 2 *	+22 *	0	04(6)	8	45	425	115	05	08
FR	49.6N	3	2042	SC*	+ 1	+25	- 6	04(2,6,7) 06(1)	6	45	295	97	10	22
BD	48.9N	3	20--					04(7)	7	44	315	134	05	13
IR	41.0N	3	1936	SC*	- 3.1	35	5	04(5,6,7)	7	36	177	92	05	09
SJ	29.9N	3	2042	SC	--	+12	+03	04(6)	6	13	189	64	05	08
GM	24.5N	3	2042	SC	- 0.6	26	- 2	--	-	13	194	56	07	01
HO	21.1N	3	2036	SC*	+01	+10	+02	05(2)	7	5	32	3	05	13
JP	17.3N	3	2042	SC	- 0.9	25	- 6	--	-	11	187	41	07	01
SH	14.6N	3	2042	SC	- 0.4	23	5	--	-	9	211	44	07	01
UJ	13.5N	3	2042	SC	- 0.6	30	- 7	--	-	9	199	53	07	01
AL	09.5N	3	2042	SC	- 0.7	23	- 6	04(4,7)	6	8	181	45	07	01
HD	07.6N	3	2040	SC	- 0.5	+24	- 2	04(5,6)	7	6	203	35	05	13
GU	04.0N	3	2042	SC	--	20	-06	04(4)	6	10	160	40	05	09
AN	01.5N	3	2042	SC	- 1.5	31	17	--	-	8	243	88	07	01
HU	00.6S	3	1235	SC	--	5	--	04(5,6,7)	6	12	333	63	05	03
PM	18.7S	3	2042	SC	+ 0.5	+25	+16	04(4,5,6,7,8)	6	9	170	100	05	15
HR	33.7S	3	2041	SC	+ 1	+22	+10	04(5,6,7)	6	51	171	187	05	07
GN	43.3S	3	2042	SC*	+ 3.2*	+30	+22	04(4,5,6,7)	7	34	160	220	05	13
TO	46.7S	3	2040	SC	+ 2.4	+22	- 5	04(4,5,6,7)	6	33	317	127	05	09
KG	56.5S	3	20--	..	..	..	..	04(6,7)	8	--	--	--	05	12
NE	55.1N	5	1628	SC*	4	9	--	06(1)	7	56	142	90	07	03
BD	48.9N	5	1629	SC*	+ 3	- 3	+ 1	06(1)	7	45	88	40	06	11
HO	21.1N	5	1627	SC	- 0	+01	+ 0	06(1)	7	5	34	3	07	01
HD	07.6N	5	1625	SC	- 0.2	+11	- 1	06(1,2,3)	5	4	81	22	07	02
GU	04.0N	5	1628	..	..	..	..	06(1)	5	--	140	40	07	05
HU	00.6S	5	1628	SC*	2	56	2	06(6)	6	9	280	33	06	21
PM	18.7S	5	1628	SC	+ 0.4	+12	+10	06(1)	6	6	120	80	07	05
HR	33.7S	5	1628	SC	+ 0	+ 6	+ 4	06(1)	6	13	111	83	07	03
GN	43.3S	5	1629	SC	+ 1.6	+12	+10	06(1)	6	14	110	80	07	01
TO	46.7S	5	1625	SC	+ 2.0	+11	- 2	06(1)	6	17	201	40	07	05
KG	56.5S	5	1627	SC*	--	--	--	06(1)	6	--	--	--	07	09
HD	07.6N	7	1420	..	..	..	..	07(8) 08(2,4)	4	3	107	20	08	23
GU	04.0N	7	2151	..	..	..	..	08(2)	5	--	70	30	08	17
PM	18.7S	7	19--	..	..	..	..	08(4)	6	7	100	60	08	16
CO	64.6N	9	1625	SC*	-26	+168	-22	09(6) 10(1,3,4,6)	5	97	810	330	10	23
NE	55.1N	9	1624	SC*	5	13	--	09(3) 10(1)	5	23	102	103	11	16
WI	54.2N	9	1625	SC*	+ 3 *	+67 *	0	09(8)	6	30	130	50	10	22
BD	48.9N	9	1626	SC*	+ 7	+ 9	- 1	10(1)	5	18	58	46	10	12
IR	41.0N	9	1624	SC	- 2.4	48	8	09(8)	6	24	97	33	10	24
GM	24.5N	9	1625	SC	- 0.8	37	- 3	--	-	5	72	23	10	22
HO	21.1N	9	1624	SC	-01	+03	+02	10(1)	7	2	30	1	10	09
JP	17.3N	9	1625	SC	- 1.3	33	- 9	--	-	4	73	31	10	22
SH	14.6N	9	1625	SC	- 0.4	31	6	--	-	5	67	22	10	22
UJ	13.5N	9	1625	SC	- 0.7	40	- 9	--	-	3	90	26	10	22
AL	09.5N	9	1625	SC	- 0.9	30	- 8	09(6)	5	3	71	26	10	22
HD	07.6N	9	1624	SC	- 0.4	+34	- 2	09(6)	5	3	81	14	10	23
AN	01.5N	9	1625	SC	- 1.8	39	21	--	-	3	99	39	10	22
HU	00.6S	9	1624	SC*	4	141	8	09(6)	6	12	341	48	10	22
PM	18.7S	9	1625	SC*	- 0.2*	+27	+23	09(6)	5	9	60	30	10	12
HR	33.7S	9	1626	SC	+ 2	+27	+17	09(6)	5	21	69	67	10	12
KG	56.5S	9	1625	SC*	--	--	--	09(8) 10(1)	6	--	--	--	11	18
CO	64.6N	16	12--	..	..	..	..	16(5,6)	6	172	1060	430	17	04
GM	24.5N	16	0800	..	..	..	..	--	-	6	147	19	17	01
JP	17.3N	16	0800	..	..	..	..	--	-	4	133	17	17	01
SH	14.6N	16	0800	..	..	..	..	--	-	3	131	14	17	01
UJ	13.5N	16	0800	..	..	..	..	--	-	3	145	14	17	01
AL	09.5N	16	0800	..	..	..	..	16(5)	6	4	146	9	17	01
HD	07.6N	16	0758	SC	0.0	+ 8	0	16(5,6)	6	3	167	27	18	12
AN	01.5N	16	0800	..	..	..	..	--	-	3	174	43	17	01
HU	00.6S	16	0802	..	..	..	..	16(6)	5	8	172	26	16	23
HR	33.7S	16	11--	..	..	..	..	16(5)	5	24	95	107	17	03
HO	21.1N	25	1536	SC	+01	+02	+01	25(7)	5	2	9	2	26	23
HD	07.6N	25	1536	SC	- 0.2	+11	- 2	25(8)	5	3	50	24	26	23
HU	00.6S	25	1525	SC*	2	87	6	25(6,7)	5	10	225	23	26	02
KG	56.5S	25	1337	SC	--	--	--	26(1)	5	--	--	--	26	21
SI	60.0N	28	09--	..	..	..	..	30(4)	8	--	--	--	31	21
NE	55.1N	28	1854	..	..	..	..	30(4)	8	56	501	297	01	06
FR	49.6N	28	18--	..	..	..	..	29(4,5,6) 30(3,4)	5	27	139	72	01	06
BD	48.9N	28	1854	SC	+ 1	+ 5	- 1	29(5)	6	26	110	30	29	21
IR	41.0N	28	15--	..	..	..	..	29(6) 30(3,4)	6	22	180	59	31	23
GM	24.5N	28	1600	..	..	..	..	--	-	7	185	41	31	01
HO	21.1N	28	1853	SC	+01	+04	+01	30(3)	7	11	25	9	01	05
JP	17.3N	28	1600	..	..	..	..	--	-	8	139	40	31	01
SH	14.6N	28	1600	..	..	..	..	--	-	5	186	32	31	01
UJ	13.5N	28	1600	..	..	..	..	--	-	6	140	41	31	01
AL	09.5N	28	1600	..	..	..	..	29(5,6)	6	6	150	41	31	01
HD	07.6N	28	1852	SC	- 0.2	+16	- 2	29(5,6)	6	4	171	31	29	19
GU	04.0N	28	1853	SC	--	15	-03	30(3)	6	10	230	40	31	24

PRINCIPAL MAGNETIC STORMS

JANUARY 1978

OBS. 2 letter IAGA code	GEOMAG-NETIC LATI-TUDE	COMMENCEMENT DAY	hr min (UT)	TYPE	SC - AMPLITUDES D(')	H(y)	Z(y)	MAXIMUM 3 HOUR - INDEX K DAY(3 HOUR PERIOD)	K	RANGES D(')	H(y)	Z(y)	UT END DAY	HOUR
AN	01.5N	28	1600	..	..	..	..	--	-	6	207	69	31	01
HU	00.6S	28	1446	..	..	..	..	29(6)	7	13	310	68	30	21
PH	10.7S	28	1854	SC	0	+19	+16	30(3,4)	6	12	180	100	31	00
HR	33.7S	28	18--	..	..	..	..	29(6)	5	20	124	102	30	15
TO	46.7S	28	16--	..	..	..	..	30(4)	6	29	179	90	30	13
KG	56.5S	28	17--	..	..	..	..	29(5,6) 30(4)	6	--	--	--	30	18
CO	64.6N	29	04--	..	..	..	..	29(5) 30(4)	8	558	2590	1450	01	05
WI	54.2N	29	04--	..	..	..	..	29(6)	6	25	175	98	31	24
HD	07.6N	29	2015	SC	- 0.4	+16	- 2	30(4)	6	4	171	27	31	22
GN	43.3S	29	2017	SC	+ 1.8	+20	+11	30(4)	6	25	110	150	30	14
BD	48.9N	30	03--	..	..	..	..	30(4)	6	28	127	76	30	17
HU	00.6S	31	0622	..	..	..	..	31(5,6)	5	9	196	58	31	21

Reports were received from the following observatories:

Alibag Annamalainagar Boulder College Fredericksburg Gnangara Guam Gulmarg Hermanus Honolulu Huancayo Irkutsk Jaipur Kerguelen Newport San Juan Shillong Sitka Toolang Trivandrum Tucson Ujjain Witteveen

SUDDEN COMMENCEMENTS AND SOLAR FLARE EFFECTS

JANUARY 1978

PRELIMINARY REPORT ON RAPID MAGNETIC VARIATIONS (by Dr. A. Romaná)
The meaning of the station symbols is given in the IAGA-News No. 16.
Times of ssc are mean values.

Sudden commencements followed by a magnetic storm or a period of storminess (ssc).

03 2042 A: SOD VIC FUR COI FRD KSA PAF DRV; B: ESK WNG WIT HAD DOU MMB AQU EBR TOL KAK KNY; C: CLF CZT

05 1628 B: SOD ESK WNG HAD DOU VIC FUR AQU COI TOL KAK KNY PAF DRV; C: WIT NGK CLF MMB EBR (si: A: DOB)

09 1625 A: SOD WNG WIT VIC FUR CLF OTT EBR COI TOL PAF; B: DOB ESK NGK HAD DOU AQU KAK KNY CZT DRV; C: MMB (si: B: KSA)

25 1537 B: ESK WNG HAD VIC FUR AQU KSA PAF DRV; C: WIT NGK CLF TOL KNY CZT

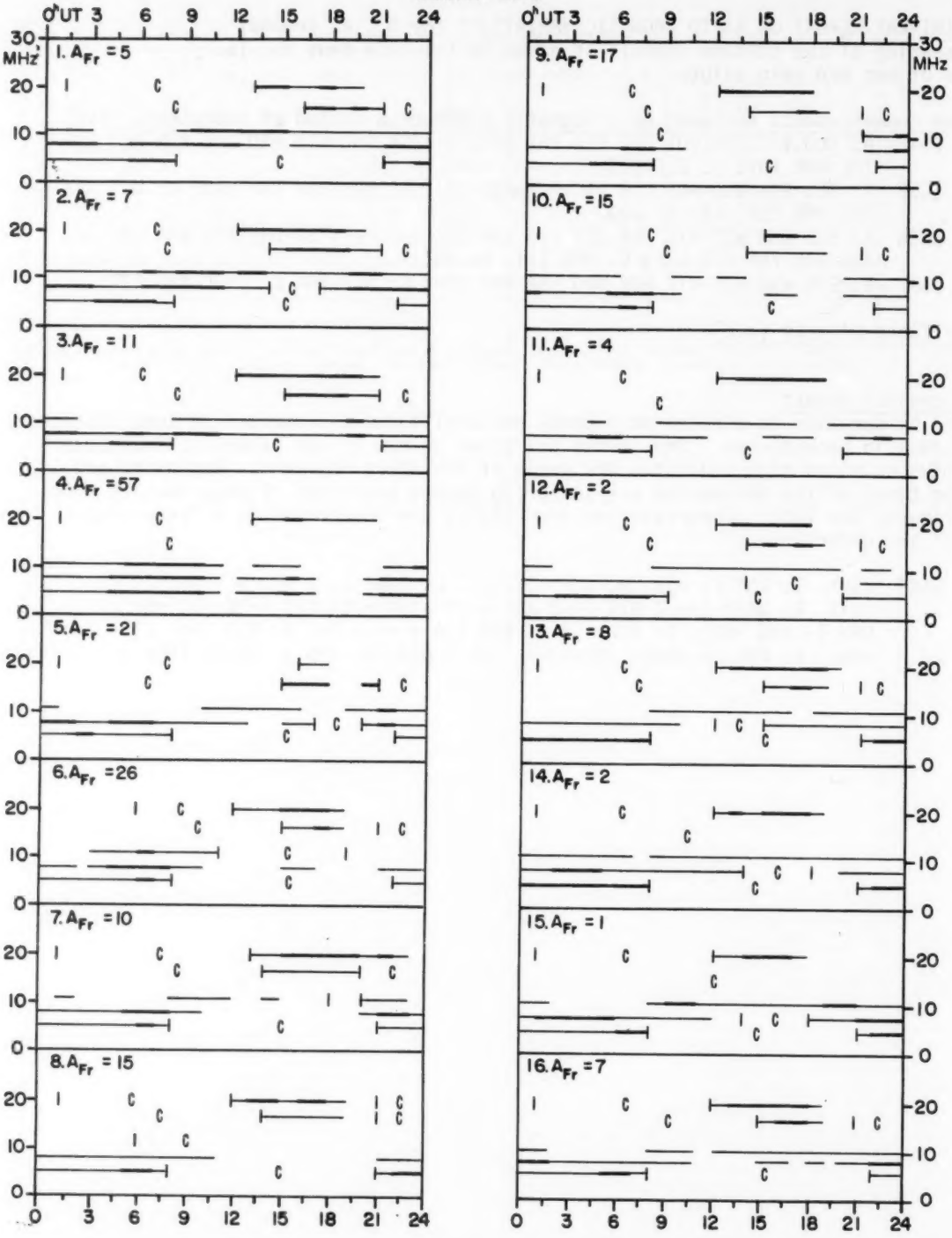
Solar-flare effects (sfe)
None

Very unusual events
Period or duration in minutes or seconds and amplitudes as reported by some stations are added in parentheses. Amplitudes are given in nT, if not otherwise indicated. The plus or minus sign indicates the sense of the sharp movement. Beginning and ending times of the phenomenon are added (in square brackets) if they deviate from the time at the left. Observatories identifying the phenomenon as a "very unusual event" are underlined.

06 0623 ssc: A: COI (+ -); B: CLF* (---); C: MMB* (+22 +27 -7) -
si: A: WNG* (---) WIT (--) PAF (-34 +100 +11) CZT (+20 +10 +5)
DRV (- +85 +80); B: NGK* (+ +) EBR (+ + +) - bs: A: KSA (+N -E) -
pse: A: FUR [- 0626] (50-100s, 10) - pi2: A: MMB [- 0735] (50s y + 0.81nT/s)

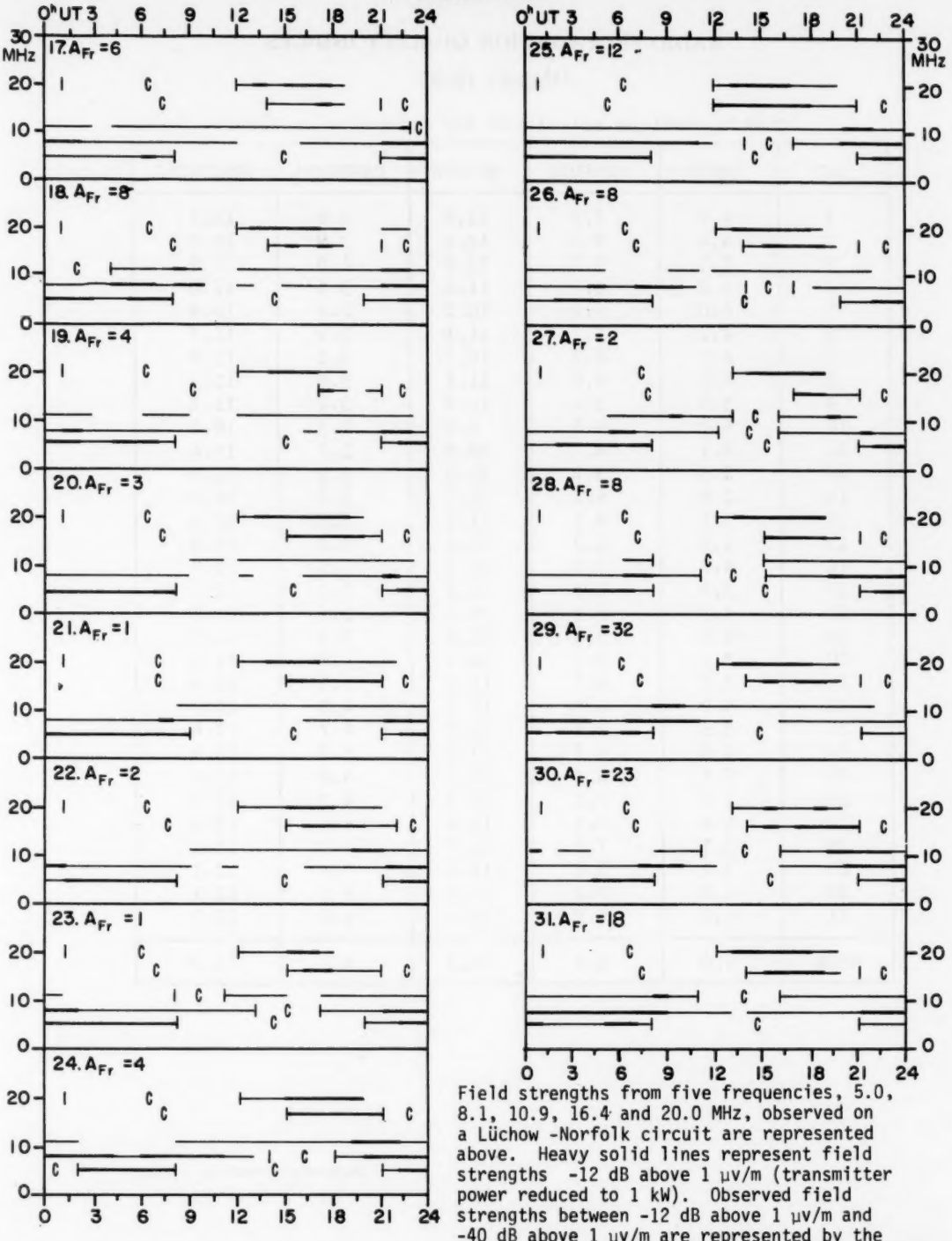
TRANSMISSION FREQUENCY RANGES -- NORTH ATLANTIC PATH

JANUARY 1978



TRANSMISSION FREQUENCY RANGES -- NORTH ATLANTIC PATH

JANUARY 1978



Field strengths from five frequencies, 5.0, 8.1, 10.9, 16.4 and 20.0 MHz, observed on a Lüchow -Norfolk circuit are represented above. Heavy solid lines represent field strengths -12 dB above 1 μv/m (transmitter power reduced to 1 kW). Observed field strengths between -12 dB above 1 μv/m and -40 dB above 1 μv/m are represented by the fine line. Adapted from Observations by Deutsche Bundespost

RADIO PROPAGATION QUALITY INDICES

JANUARY 1978

Quality indices calculated for reception at Lüchow

DAY	TOKYO	NORFOLK	MOSCOW	CANBERRA	BRACKNELL
1	4.7	7.9	11.8	3.9	12.7
2	4.4	8.1	12.9	3.9	13.0
3	5.5	7.7	12.0	4.0	12.8
4	3.8	6.4	11.6	3.4	12.0
5	4.0	5.0	10.2	2.4	10.4
6	4.2	5.7	11.1	2.8	11.7
7	4.7	6.2	10.7	3.2	12.0
8	4.5	6.0	11.1	3.0	12.3
9	3.5	5.4	10.5	3.4	11.2
10	4.0	4.8	8.8	2.9	10.4
11	2.1	4.7	10.5	2.7	10.6
12	2.3	5.2	11.0	3.1	11.6
13	2.9	6.3	11.7	3.2	12.0
14	3.1	6.1	11.1	3.6	12.3
15	2.2	6.2	11.4	3.3	12.8
16	4.7	5.8	11.3	3.5	12.7
17	3.8	6.5	11.2	2.7	12.2
18	3.3	6.3	10.9	2.6	10.7
19	4.2	5.8	12.2	3.1	11.2
20	3.3	6.3	12.1	4.8	12.6
21	3.6	6.7	11.3	4.5	12.6
22	4.2	6.9	12.3	4.8	12.7
23	3.6	7.1	12.5	4.7	12.6
24	4.4	6.7	13.0	5.3	13.4
25	5.5	6.2	12.2	4.9	13.1
26	5.5	7.2	12.3	4.3	12.3
27	4.8	7.5	12.4	4.4	12.9
28	5.5	7.5	12.5	4.7	13.3
29	3.6	6.8	11.4	4.4	12.3
30	4.3	7.2	11.6	3.8	12.1
31	5.3	6.6	11.4	4.0	12.3
MEAN	4.0	6.4	11.5	3.7	12.2

USCOMM-NOAA-ASHEVILLE,NC-4/78-950

MARCH 1978 Number 403 - Part II

P-A STACKS

Solar-Geophysical Data comprehensive reports

DEPARTMENT OF COMMERCE
UNITED STATES OF AMERICA

MAY 01 1978

Data for September 1977 -- August 1977 & Miscellanea
Explanation of Data Reports Issued as Number 402 (Supplement) February 1978

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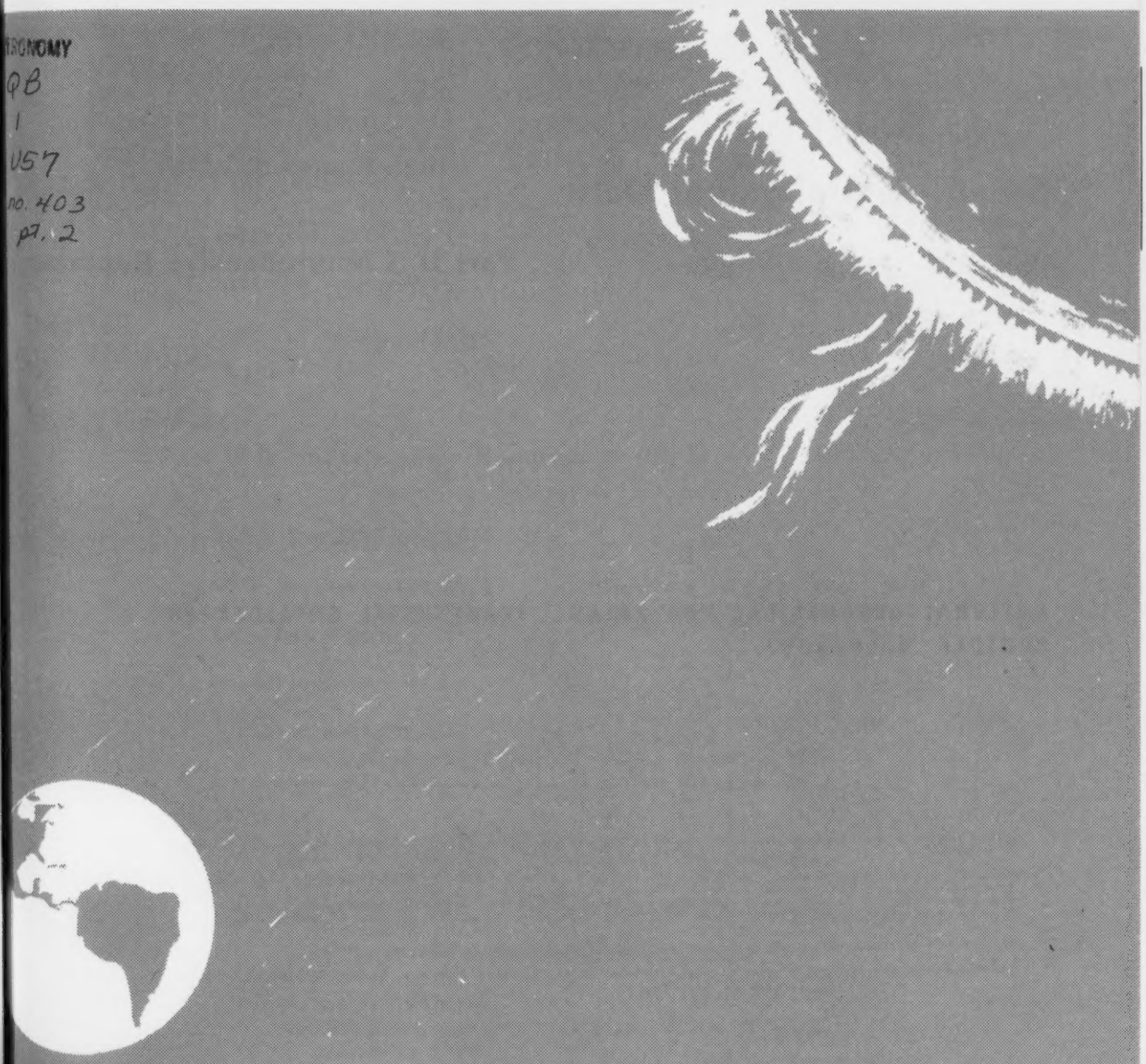

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Solar - Geophysical Data

NO. 403 MARCH 1978

Part II (Comprehensive Reports)

DATA FOR
SEPTEMBER 1977
AUGUST 1977
& MISCELLANEA

NATIONAL GEOPHYSICAL AND SOLAR - TERRESTRIAL DATA CENTER
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For obtaining bulletins on a data exchange basis, send request to: World Data Center A for Solar-Terrestrial Physics, NOAA, Boulder, Colorado 80302.

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To standardize referencing these reports in the open literature, the following format is recommended:

Solar-Geophysical Data, 390 Part I (or Part II), pages, February 1977, U.S. Department of Commerce, (Boulder, Colorado, U.S.A. 80302).

SOLAR-GEOPHYSICAL DATA

No. 403

Issued in two parts

Helen E. Coffey, Editor

J. Virginia Lincoln, Director
Solar-Terrestrial Data Services Division

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A.4	H-alpha Filtergrams	398A 36	399A 34	400A 30	401A 36	402A 38	403A 47	
A.5	Calcium Plage Drawings - McMath (or Catania)	398A 36	399A 34	400A 30	401A 36	402A 38	403A 47	
A.5a	Calcium Plage (McMath) and Sunspot Regions	398A 98	399A 94	400A 92	401A 96	402A100	403A108	
A.5b	McMath Daily Calcium Plage Indices	398A105	399A 99	400A 99	401A100	402A105	403A114	
A.6	H-alpha Synoptic Charts	398A 34	399A 32	400A 28	401A 35	402A 36	403A 44	
A.6b	Synoptic Chart and Active Regions (Paris)	402B 4	403B 4					
A.7f	Helium D3 Chromosphere (Big Bear)	397A 19	398A 24	399A 24	400A 21	401A 28	402A 29	403A 36
A.7g	Helium Synoptic Maps (KPNO)	397A 20	398A 22	399A 23	400A 20	401A 27	402A 28	403A 35
A.7h	Coronal Line Emission (Sac Peak)	398A 36	399A 34	400A 30	401A 36	402A 38	403A 46	
A.8aa	2800 MHz - Daily Values of Solar Flux (ARO-Ottawa)	397A 7	398A 7	399A 7	400A 7	401A 7	402A 9	403A 9
A.8ac	2800 MHz - Daily Values of Adj. Solar Flux (ARO-Ottawa)	397A 7	398A 7	399A 7	400A 7	401A 7	402A 9	403A 9
A.8g	Daily Values of Adjusted Solar Flux (AFGL)	397A 7	398A 7	399A 7	400A 7	401A 7	402A 9	403A 9
A.9cb	8.6 mm Radio Maps of the Sun (NOSC - La Posta)	398A 36	400B 57	400A 30	401A 36	402A 38	403A 47	
A.9d	2 cm Radio Maps of the Sun (NOSC - La Posta)	398A 36	400B 52	400A 30	401A 36	402A 38	403A 47	
A.10a	169 MHz - Interferometric Observations (Nancay)	397A 13	398A 14	399A 14	400A 12	401A 15	402A 16	403A 20
A.10c	21 cm East-West Solar Scans (Fleurs)	397A 15	398A 16	399A 16	400A 14	401A 17	402A 19	403A 23
A.10d	43 cm East-West Solar Scans (Fleurs)	397A 16	398A 17	399A 17	400A 15	401A 18	402A 20	403A 24
A.10e	10.7 cm East-West Solar Scans (Ottawa-ARO)	397A 14	398A 15	399A 15	400A 13	401A 16	402A 18	403A 22
A.10f	3 cm East-West Solar Scans (Toyokawa)					403B 68	402A 17	403A 21
A.11ab	Solar X-ray Radiation (SOLRAD 11)						403A116	
A.11g	Solar X-ray (SMS/GOES)	---	398A 25	399A 20	400A 17	401A 22	402A 24	403A 29
A.11h	Solar X-ray (OSO-8; 1975-057A)	398A 36	399A 34	400A 30	401A 36	402A 38	403A 46	
A.11i	Solar X-ray (Columbia U.)							
A.12ba	Cosmic Ray Protons (Pioneers 6 & 7)	397A 23	---	399A 26	---	---	402A 30	
A.12bb	Cosmic Ray Protons (Pioneers 8 & 9)	---	---	399A 27	---	---	402A 31	
A.12e	Energetic Solar Particles (IMP H & J)	402B 24	403B 37					
A.13a	Solar Wind (Pioneers 6 & 7)	397A 23	---	399A 26	---	---	402A 30	
A.13ab	Solar Wind (Pioneers 8 & 9)	---	---	399A 27	---	---	402A 31	
A.13d	Solar Wind from IPS Measurements	397A 27	398A 27	399A 25	400A 25	401A 29	402A 34	403A 37
A.13e	Solar Plasma (IMP H & J)	402B 23	403B 22					
A.17	Interplanetary Magnetic Field (Pioneer 8)	---	---	---	---	---	---	
A.17	Interplanetary Magnetic Field (Pioneer 9)	---	---	---	---	---	402A 31	
A.17c	Inferred IP Magnetic Field	397A 24	398A 28	400A 22	400A 22	401A 30	402A 32	403A 38
A.18	Interplanetary Electric Field (Pioneer 8)	---	---	399A 27	---	---	---	
A.18	Interplanetary Electric Field (Pioneer 9)	---	---	---	---	---	402A 31	
B.	IONOSPHERIC (AND RADIO WAVE PROPAGATION) PHENOMENA							
B.52	Graphs of Transmission Frequency Range	398A124	399A128	400A120	401A116	402A132	403A148	
B.53	Quality Figures Based on Frequency Ranges	398A126	399A127	400A122	401A118	402A131	403A150	
C.	FLARE-ASSOCIATED EVENTS							
C.1a	Optical Observations Flares	397A 10	398A 10	399A 10	400A 10	401A 10	402A 12	403A 12
C.1ba	Optical Observations Flares (Standardized Data)	402B 8	403B 8					
C.1d	Flare Patrol Observations	397A 12	398A 13	399A 13	400A 11	401A 14	402A 15	403A 19
C.1d	Flare Patrol Observations	402B 17	403B 21					
C.1e	Flare Indices (by day)	402B 16	403B 20					
C.1f	Flare Indices (by Region)	403B 53						
C.3	Solar Radio Waves - Outstanding Occurrences	402B 18	403B 22					
	Solar Radio Waves - Fixed Frequencies - Selected	397A 17	398A 18	399A 18	400A 16	401A 19	402A 21	403A 25
C.3t	43.25, 80 and 160 MHz Selected Bursts (Culgoora)	399B 36	399A113	401B 44	403B 64	403B 65		
C.4a	Solar Radio Spectral Obs. (Fort Davis)	398A107	399A102	400A101	401A102	402A108	403A132	
C.4d	Solar Radio Spectral Obs. (Culgoora)	400B 62	399A102	401B 38	403B 56	403B 59		
C.4e	Solar Radio Spectral Obs. (Weissenau)	398A107	399A102	400A101	402B 42	402A108	403A132	
C.4f	Solar Radio Spectral Obs. (Sagamore Hill)	398A107	399A102	400A101	401A102	402A108	403A132	
C.4h	Solar Radio Spectral Obs. (Dwingeloo)	398A107	399A102	400A101	401A102	402A108	403A132	
C.4i	Solar Radio Spectral Obs. (Durnten)		399A102	400A101	401A102	402A108	403A132	
C.4j	Solar Radio Spectral Obs. (Manila)	397A 22	399B 37	399A 22	400A 19	401A 24	402A 26	403A 29
C.5e	Solar X-ray (SMS/GOES)							
C.5f	Solar X-ray (Columbia U.)							
C.6	Sudden Ionospheric Disturbances	398A106	399A100	400A100	401A101	402A106	403A115	
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D.1ba	27-day Chart of Kp Indices	398A119	399A122	400A115	401A111	402A127	403A144	
D.1c	27-day Chart of C9							
D.1d	Principal Magnetic Storms	398A122	399A125	400A118	401A114	402A130	403A145	
D.1e	Reduced Magnetograms							
D.1f	Sudden Commencement and Solar Flare Effects	398A123	399A126	400A119	401A115	403B 69	403A147	
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F.1b	Cosmic Ray Neutron Counts (Climax)	398A116	399A115	400A112	401A108	402A124		
F.1e	Cosmic Ray Neutron Counts (Alert)	398A116	399A115	400A112	402B 47	402A124	403A138	
F.1f	Cosmic Ray Neutron Counts (Calgary)	400B 70	400B 70	402B 47				
F.1g	Cosmic Ray Neutron Counts (Sulphur Mountain)	400B 70	---	402B 47				
F.1h	Cosmic Ray Neutron Counts (Thule)							
F.1i	Cosmic Ray Neutron Counts (Kiel)	398A116	399A115	400A112	401A108	402A124	403A138	
F.1j	Cosmic Ray Neutron Counts (Tokyo)	398A116	399A115	400A112	401A108	402A124	403A138	
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Notes:

"398A 36" listed under 1977 Aug means that data for August 1977 were contained in *Solar-Geophysical Data* Number 398 - Part I, beginning on page 36.

SEPTEMBER 1977 DATA

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ACTIVE REGIONS

CARRINGTON ROTATION 1659

(September 3 - September 30, 1977)

Region No.	Coordinates Lat.	Coordinates Long.	Age at CMP	Imp.	Spot-less Region	Region No. in Rotation 1658	Activity at West Limb
1	18°S	352°	>6	1	x		disappeared
2	15 N	343	+3	2			decreasing
3	36 S	327	-4	1	x		stable
4	25 N	325	>6	1	x	(2)	dispersed
5	19 N	317	>6	1	x		dispersed
6	26 N	312	>6	2			decreasing
7	21 N	259	>6	1	x		dispersed
8	19 N	239	>6	2		(6)	decreasing
9	15 N	205	>6	3			decreasing
10	6 N	197	>6	5			decreasing
11	17 N	169	>6	1	x		disappeared
12	23 N	147	-2	2			increasing
13	13 S	125	-2	1	x		dispersed
14	22 S	114	-5	2			increasing
15	25 N	111	>6	2			decreasing
16	23 N	103	>6	1	x		decreasing
17	25 S	98	>6	5			decreasing
18	27 N	95	>6	1	x		decreasing
19	28 N	61	+1	3			decreasing
20	42 N	50	-2	1	x		dispersed
21	17 N	44	0	2			decreasing
22	29 S	35	0	1	x		disappeared
23	26 S	28	>6	1	x		decreasing
24	19 S	18	>6	1	x		dispersed
25	20 S	5	>6	2			decreasing
26	31 S	1	+4	1	x		disappeared

ACTIVE REGIONS

CARRINGTON ROTATION 1660

(September 30 - October 27, 1977)

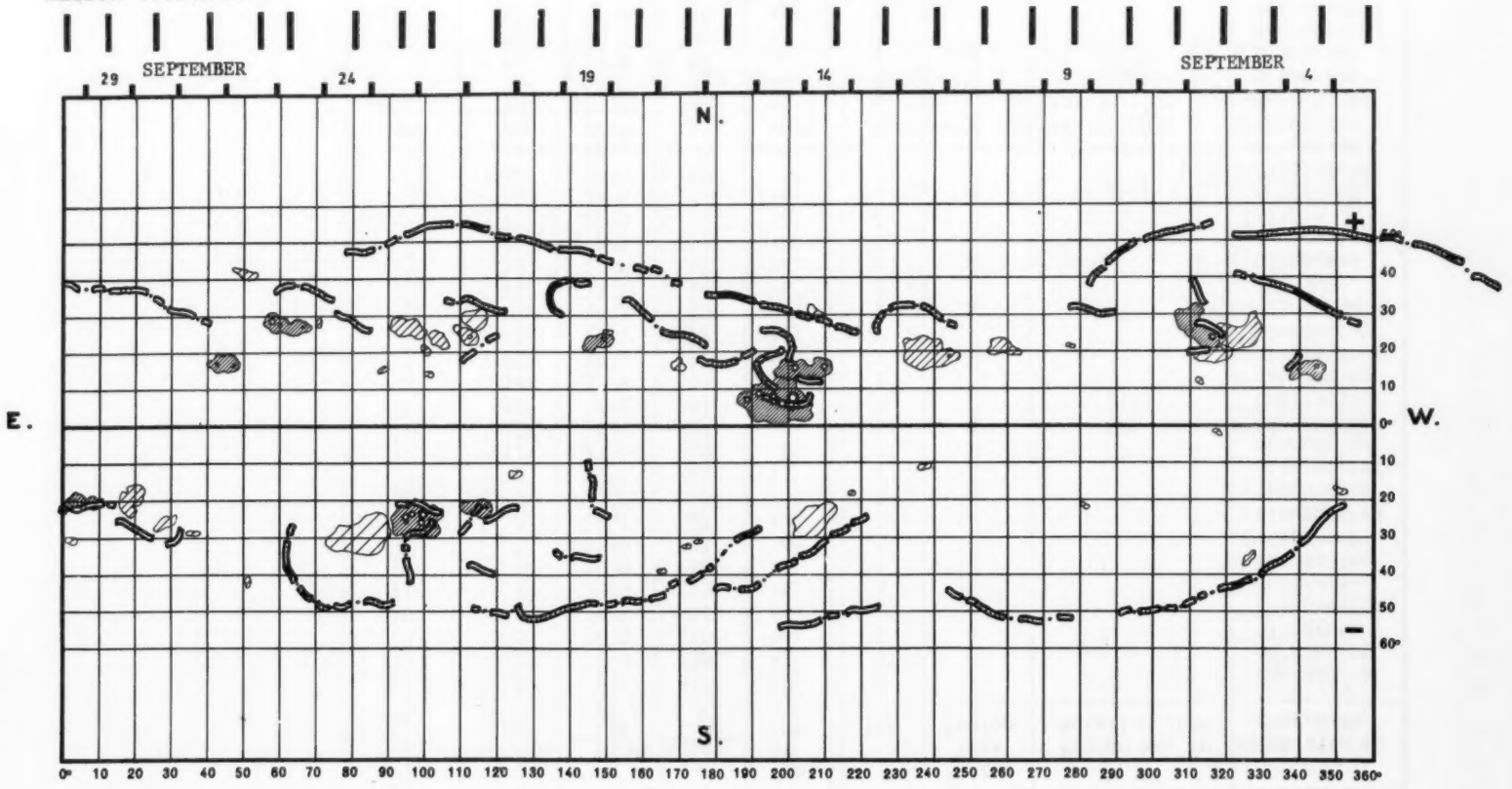
Region No.	Coordinates Lat.	Coordinates Long.	Age at CMP	Imp.	Spot-less Region	Region No. in Rotation 1659	Activity at West Limb
1	15°N	344°	>6	4			decreasing
2	32 N	338	+2	3			decreasing
3	26 N	318	>6	1	x		dispersed
4	36 S	317	+4	1	x		disappeared
5	22 S	303	>6	3			decreasing
6	20 N	298	>6	2			decreasing
7	32 N	298	>6	1	x		dispersed
8	29 N	267	+3	1	x		disappeared
9	19 N	260	+6	2	x		increasing
10	34 S	259	+1	1	x		disappeared
11	23 N	209	>6	1	x		decreasing
12	16 N	207	>6	1	x	(9)	decreasing
13	6 N	204	>6	3		(10)	decreasing
14	30 N	199	0	2			decreasing
15	17 S	191	+1	1	x		disappeared
16	18 N	173	+1	2			decreasing
17	24 S	170	-5	1	x		(?)
18	23 N	165	-5	2			(?)
19	24 N	160	>6	1	x		dispersed
20	19 N	159	>6	3			decreasing
21	23 N	148	0	2			stable
22	26 N	148	>6	1	x	(12)	dispersed
23	39 N	140	0	1	x		disappeared
24	22 S	120	+6	1	x		dispersed
25	25 S	114	+6	1	x		dispersed
26	23 N	109	+6	3			decreasing
27	28 S	91	>6	1	x	(17)	dispersed
28	29 N	89	>6	1	x	(18)	dispersed
29	24 S	85	+3	4			decreasing
30	17 N	81	+6	1	x		dispersed
31	29 N	63	>6	1	x	(19)	dispersed
32	29 N	48	>6	1	x	(19)	dispersed
33	18 N	43	-2	2			decreasing
34	26 S	40	+4	1	x		decreasing
35	31 N	30	>6	1	x		dispersed

SYNOPTIC SOLAR MAP

CARRINGTON ROTATION 1659

SEPTEMBER 3 TO SEPTEMBER 30, 1977

MEUDON OBSERVATORY

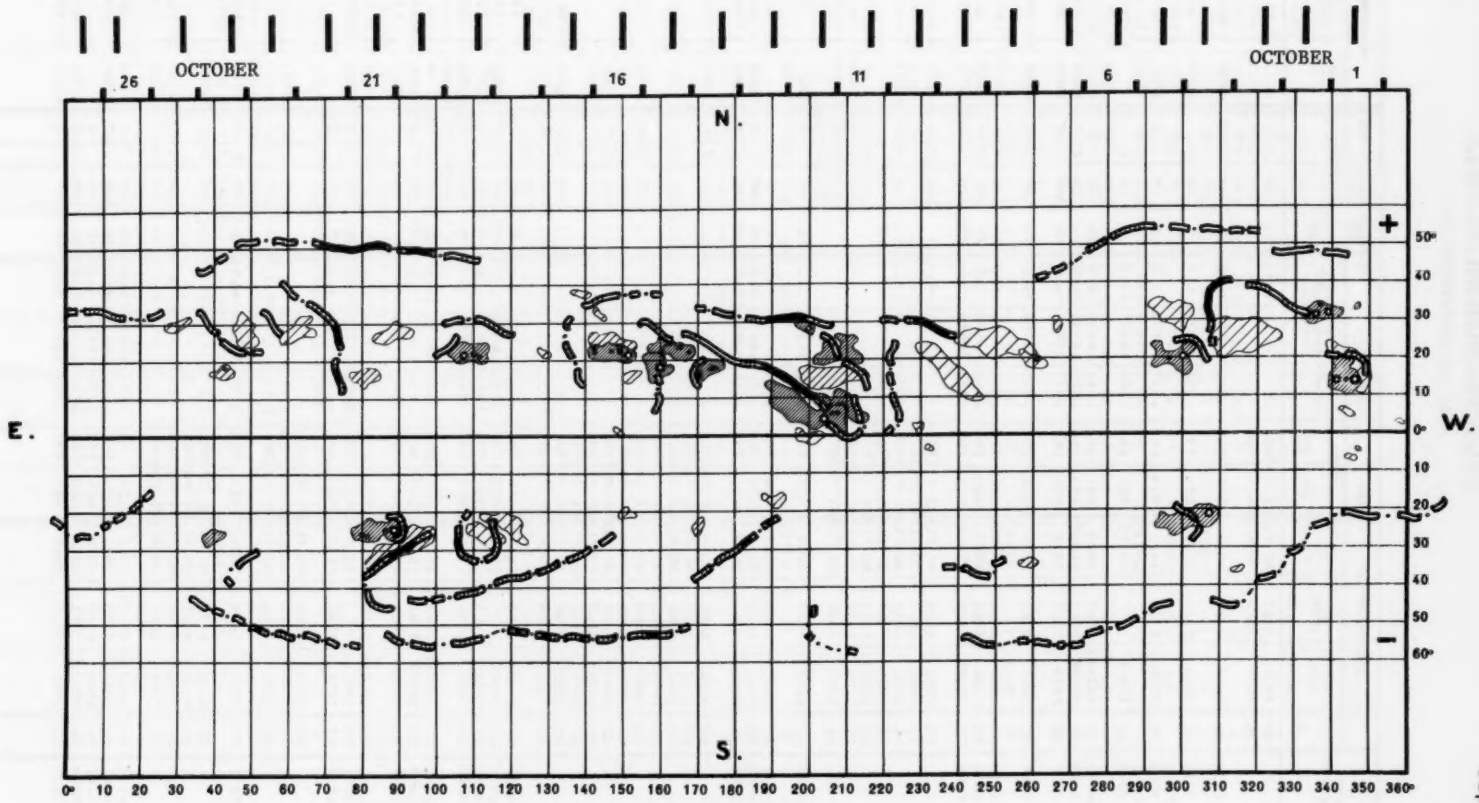


SYNOPTIC SOLAR MAP

CARRINGTON ROTATION 1660

SEPTEMBER 30 TO OCTOBER 27, 1977

MEUDON OBSERVATORY



7 Sep 77

Hα SOLAR FLARES

SEPTEMBER 1977

OBSERVATORY	OBSERVED UT				LOCATION					DURATION	IMPORTANCE	OBS.		MEASUREMENTS			REMARKS
	DATE SEP	START	MAX. PHASE	END	APPROX. LAT.	APPROX. MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMP. DAY	MIN.		COND.	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR. AREA Sq. Deg.	
	01	0015	0102	NO FLARE PATROL													
	01	0105	0134	NO FLARE PATROL													
473 MITK	01	0407	0410	0415	S25	W67	.954	14915	27.1	8	-N		C	0410	120		Y5
474 CATA	01	0655	0655	0700	N24	E71	.938	14930	6.6	5	-N	2		0655	56		Y5
475 MONT	01	0736	0756	0821	N26	E69	.927	14930	6.5	45	-N		C	0756	180		Y5
476 ATHN	01	0747E		0747D	N21	W40	.656	14931	29.3		-N	1			123		Y5
GRP64477	01	0830+3	0857	0903	N27	E68	.922	14930	6.5	33	-N						E
CATA	01	0830E	0830	0830D	N29	E68	.923	14930	6.5		1N	2		0830	73		
MONT	01	0833	0857	0903	N26	E69	.927	14930	6.5	30	-N		C	0857	80		E
478 MONT	01	0917	0923	0931	N26	E68	.921	14930	6.5	14	-F		C	0923	60		E Y5
GRP64479	01	1335	1340	1400D	N21	E62	.877	14930	6.2	25	-F						
CATA	01	1335	1340	1400	N24	E60	.864	14930	6.1	25	-F	2		1340	67	1.4	
LVOV	01	1348E	1434	1517D	N19	E64	.892	14930	6.4	89D	1F		C	1434	100		A
	01	1550	1555	NO FLARE PATROL													
	01	1609	1613	NO FLARE PATROL													
	01	1623	1632	NO FLARE PATROL													
	01	1635	1647	NO FLARE PATROL													
	01	1648	1710	NO FLARE PATROL													
	01	1726	1730	NO FLARE PATROL													
	01	1750	2336	NO FLARE PATROL													
480 VORO	02	0205	0207	0220	N26	E57	.841	14930	6.4	15	-N		C	0207	45	.8	EJ Y5
GRP64481	02	0617	0618	0621	N26	E62	.881	14930	6.9	4	-F				60	1.4	D
HTPR	02	0617	0618	0620	N26	E62	.881	14930	6.9	3	-F		C	0618	60	1.2	
BUCA	02	0618E		0622	N26	E62	.881	14930	6.9	4D	-F		C	0618	64	1.4	CD
	02	1654	1701	NO FLARE PATROL													
	02	2036	2037	NO FLARE PATROL													
	02	2047	2050	NO FLARE PATROL													
	02	2058	2101	NO FLARE PATROL													
	02	2107	2129	NO FLARE PATROL													
	02	2200	0006	NO FLARE PATROL													
	03	0007	0027	NO FLARE PATROL													
	03	0038	0043	NO FLARE PATROL													
	03	0055	0102	NO FLARE PATROL													
	03	0139	0146	NO FLARE PATROL													
	03	0203	0204	NO FLARE PATROL													
GRP64482	03	1449+3	1453+1	1458	N24	E36	.620	14930	6.3	9	-F				20	.3	D
LVOV	03	1449E	1454	1500D	N23	E35	.604	14930	6.2	11D	-F		C	1454	100	1.3	D
HTPR	03	1451	1453	1455	N25	E38	.648	14930	6.5	4	-F		C	1453	20	.2	
MCMA	03	1452	1454	1458	N23	E35	.604	14930	6.2	6	-N		C	1454	20	.3	D
GRP64483	03	1457+6	1508+6	1537	S32	W43	.836	14924	31.4	40	-N						E
LVOV	03	1457E	1508	1520D	S32	W43	.836	14924	31.4	23D	1F		C	1508	150	2.8	
MCMA	03	1503	1514	1537	S33	W44	.848	14924	31.3	34	-N		C	1514	60	.9	E
GRP64484	03	1515>9	1555	1606	N26	E37	.641	14930	6.4	51	-F						K
MCMA	03	1515		1611	N27	E38	.657	14930	6.5	56	-F		C	1530	100	1.4	EFK
KANZ	03	1551	1555	1600	N25	E37	.637	14930	6.4	9	-F		C				D
	04	2117	2151	NO FLARE PATROL													
	04	2155	2235	NO FLARE PATROL													
	05	0135	0144	NO FLARE PATROL													
485 PALE	05	2103	2104	2124	N23	E08	.301	14930	6.5	21	-F	3	C		43		DE F Y5
	06	0122	0137	NO FLARE PATROL													
	06	0140	0148	NO FLARE PATROL													
	06	0204	0209	NO FLARE PATROL													
	06	0212	0217	NO FLARE PATROL													
GRP64486	06	0902+2	0908+2	0920	N24	00	.288	14930	6.4	18	-F				15	.2	E
MONT	06	0848	0856	0923	N25	E07	.325	14930	6.9	35	-F		C	0856	60		E
KANZ	06	0902	0910	0922	N24	E00	.288	14930	6.4	20	-N		C				E
HTPR	06	0903	0908	0918	N24	W01	.289	14930	6.3	15	-F		C	0908	10	.1	E
MEUD	06	0904	0908	0918	N24	W01	.289	14930	6.3	14	-F		C	0908	20	.2	E

Hα SOLAR FLARES

SEPTEMBER 1977

OBSERVATORY	OBSERVED UT				LOCATION					DURATION	IMPORTANCE	OBS.		MEASUREMENTS			REMARKS
	DATE SEP	START	MAX. PHASE	END	APPROX LAT.	APPROX MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMP DAY	MIN.		CONC	TYPE	TIME UT	MEAS. AREA Mill. of Dist	CORR AREA Sq. Deg.	
GRP64487	06	1052>9	1059+7	1112	N24	W02	.290	14930	6.3	20	-N				45	.5	E
HTPR	06	1052	1104	1112	N24	W02	.290	14930	6.3	20	-N		C	1104	50	.5	E
KHAR	06	1059E	1059	1106D	N25	W04	.312	14930	6.2	7D	-F		P				D
KANZ	06	1059	1106	1114	N24	W01	.289	14930	6.4	15	-B		C				E
MEUD	06	1102	1103	1109	N24	W02	.290	14930	6.3	7	-F		C	1103	40	.4	E
488 ZURI	06	1212	1218	1234	N42	W13	.596		5.5	22	-F		C	1218	20	.3	YS
489 ZURI	06	1246	1300	1326	N20	E72	.944	14941	11.9	40	-F		C	1300	20		YS
GRP64490	06	1252+5	1253+4	1304	N23	W02	.274	14930	6.4	12	-N				25	.3	
ZURI	06	1252	1254	1304	N23	W03	.276	14930	6.3	12	-N		C	1254	30	.3	
HTPR	06	1252	1253	1302	N23	W03	.276	14930	6.3	10	-F		C	1253	20	.2	E
KANZ	06	1257	1257	1305	N23	W01	.272	14930	6.5	8	-N		C				D
GRP64491	06	1453+5	1454+4	1506	N23	W03	.276	14930	6.4	13	-N				30	.3	EU
HTPR	06	1453	1454	1505	N23	W04	.279	14930	6.3	12	-F		C	1454	20	.2	E
ZURI	06	1454	1454	1508	N23	W03	.276	14930	6.4	14	-N		C	1454	60	.7	
HUAN	06	1454		1500	N22	W04	.263	14930	6.3	6	-F	1	C	1459	25	.3	
KANZ	06	1458	1458	1506	N23	W02	.274	14930	6.5	8	-B		C				U
GRP64492	06	1548+0	1549	1555	N23	W03	.276	14930	6.4	7	-F				20	.2	
HTPR	06	1548	1549	1555	N23	W04	.279	14930	6.4	7	-F		C	1549	10	.1	
ZURI	06	1548	1548	1548D	N23	W03	.276	14930	6.4		-F		P	1548	30	.3	
	06	1751	1801	NO FLARE PATROL													
	06	1823	1852	NO FLARE PATROL													
	06	2101	2117	NO FLARE PATROL													
	07	0148	0150	NO FLARE PATROL													
493 HITK	07	0220	0222	0238D	N22	E70	.932	14941	12.3	18D	-N		C	0222	50		E YS
GRP64494	07	1356+2	1357+1	1402	N17	W40	.646	14935	4.6	6	-F				50	.7	E
HTPR	07	1356	1357	1401	N16	W39	.631	14935	4.7	5	-F		C	1357	50	.6	E
KANZ	07	1358	1358	1406	N17	W44	.695	14935	4.3	8	-F		C				
ZURI	07	1358	1358	1402	N17	W40	.646	14935	4.6	4	-N		C	1358	50	.7	
495 HUAN	07	1538	1549	1550	N10	E90	1.000	14943	14.4	12	-F	1	C	1549	20		D YS
GRP64496	07	1625+1	1625	1629	N21	E46	.725	14940	11.1	4	-F				25	.4	
HTPR	07	1625	1625	1628	N21	E47	.736	14940	11.2	3	-F		C	1625	30	.5	
HUAN	07	1626		1629	N22	E46	.727	14940	11.1	3	-F	1	C				E
MCMA	07	1629E		1637	N21	E46	.725	14940	11.1	8D	-N		P	1629	20	.3	D
GRP64497	07	1650+1	1653+1	1702	N20	E63	.885	14941	12.4	12	-F				25	.6	D
MCMA	07	1650	1653	1705D	N20	E65	.899	14941	12.6	15D	-N		C	1653	25	.6	D
HTPR	07	1651	1654	1658	N20	E62	.877	14941	12.4	7	-F		C	1654	20	.3	
498 HUAN	07	1759E		1807	N10	E90	1.000	14943	14.5	8D	-F	1	P				YS
	07	1810	1818	NO FLARE PATROL													
	07	1823	1843	NO FLARE PATROL													
	07	1944	1956	NO FLARE PATROL													
	07	2010	2120	NO FLARE PATROL													
GRP64499	07	2255	2315+6	0002	N10	E90	1.000	14943	14.7	67	1N						EHJY
VORO	07	2255	2321	0002	N09	E90	1.000	14943	14.7	67	1N		C				EHJ
CULG	07	2258E	2315U	2320U	N12	E90	1.000	14943	14.7	22D	1N		P	2315	80		Y
GRP64500	08	0652E	0708	0930D	N09	E90	1.000	14943	15.0	158	-F						K
			0836														
MONT	08	0652E	0708	1023D	N09	E90	1.000	14943	15.0	211D	-F		C	0708	20		K
KANZ	08	0709E	0709	1004D	N08	E90	1.000	14943	15.0	175D	-F						T K
ZURI	08	0824	0836	0842	N08	E90	1.000	14943	15.1	18			C				
CATA	08	0825	0830	0830D	N11	E90	1.000	14943	15.1	5D	1F	1		0830	56		
CATA	08	0843E	0843	0843D	N10	E90	1.000	14943	15.1		1F	1		0843	56		
KHAR	08	0900E		0930D	N09	E90	1.000	14943	15.1	30D	1F		V				T
GRP64501	08	1228+0	1228+3	1245	N21	W26	.479	14930	6.6	17	-F						E
HTPR	08	1228	1231	1240	N21	W24	.453	14930	6.7	12	-F		C	1231	20	.2	
ZURI	08	1228	1230	1246	N21	W26	.479	14930	6.6	18	-N		C	1230	80	1.0	
KANZ	08	1228	1228	1245	N21	W27	.492	14930	6.5	17	1N		C				
KHAR	08	1230E	1230	1238D	N21	W27	.492	14930	6.5	8D	-F		P				E
502 CATA	08	1340E	1345	1345D	N10	E90	1.000	14943	15.3	5D	?F	1		1345	67		YS
	IMP.1 NO 1 HTPR2 HUAN1																

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OBSERVATORY	OBSERVED UT				LOCATION					DURATION	IMPORTANCE	OBS.		MEASUREMENTS			REMARKS	
	DATE	START	MAX. PHASE	END	APPROX. LAT.	APPROX. MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMP. DAY	MIN.		CONC.	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR. AREA Sq. Deg.		
503 HUAN	08	1359	1404	1412	N08	E90	1.000	14943	15.3	13	-F	1	C	1404	25		D	YS
504 HUAN	08	1427	1433	1441	N06	E90	1.000	14943	15.4	14	-F	1	C	1433	20		D	YS
505 MCMA	08	1444	1450	1457	N07	E90	1.000	14943	15.4	13	-F		C	1450				YS
506 MCMA	08	1516	1517	1521	N07	E90	1.000	14943	15.4	5	-F		C	1517				YS
507 MCMA	08	1640E		1720D	N07	E90	1.000	14943	15.4	40D	-F		C					YS
508 HUAN	08	1751E		1754D	N09	E90	1.000	14943	15.5	3D	-F	1	P					YS
509 MCMA	08	1825E		1840D	N07	E90	1.000	14943	15.5	15D	-F		C					YS
510 HUAN	08	1859	1901	1903	N09	E90	1.000	14943	15.5	4	-F	1	C	1901	35		E	YS
	08	1954	2033	NO FLARE PATROL														
511 VORO	08	2354	2356	0003	N21	E43	.691	14941	12.2	9	?N		C	2356	206	2.8	E	YS
	IMP.1 NO ‡ CULG																	
512 VORO	09	0043	0044	0054	N16	E80	.980	14942	15.0	11	?N		C	0044	81	4.0	DG	YS
	IMP.1 NO ‡ CULG																	
513 TACH	09	0453		0540	N08	E88	.999	14943	15.8	47	?N		C	0517	203		E	YS
	IMP.1 NO ‡ CULG																	
514 ATHN	09	0620	0639	0655D	N03	E85	.996	14943	15.6	35D	-B	1						YS
515 KHAR	09	0725E		0750D	N08	E81	.985	14943	15.4	25D	?F		P	0740	21		OT	YS
	IMP.1 NO ‡ HTPR CATA																	
GRP64516	09	0831E	0855+4	1010D	N09	E83	.990	14943	15.6	99	1N				90			
MONT	09	0831E	0859	0953D	N08	E85	.995	14943	15.7	82D	-N		C	0859	70			
KHAR	09	0845E		0925D	N08	E81	.985	14943	15.4	40D	1F		C	0900	15		T	
CATA	09	0855	0855	0920D	N12	E84	.992	14943	15.7	25D	1N	1		0855	112			
KHAR	09	0950E		1010D	N08	E81	.985	14943	15.5	20D	1F		C				T	
GRP64517	09	1015+5	1020+7	1031	N08	E81	.985	14943	15.5	16	-N						E	
ATHN	09	1015	1020	1030	N04	E83	.992	14943	15.7	15	-B	1						
HTPR	09	1019	1027	1031	N08	E82	.988	14943	15.6	12	-F		C	1027	30	.7	E	
CATA	09	1020	1025	1030D	N09	E79	.976	14943	15.4	10D	1B	1		1025	84			
KHAR	09	1020E	1027	1120D	N08	E80	.982	14943	15.4	60D	1F		C				T	
GRP64518	09	1025+0	1028+2	1044	N18	W67	.913	14935	4.4	19	-F						D	
HTPR	09	1025	1028	1037	N18	W67	.913	14935	4.4	12	-F		C	1028	20	.5		
KHAR	09	1025E	1030	1050D	N18	W67	.913	14935	4.4	25D	1F		C				D	
GRP64519	09	1609+3	1616+4	1625	N08	E83	.991	14943	15.9	16	-N				25		E	
MCMA	09	1609	1620	1630D	N07	E85	.995	14943	16.0	21D	-N		C	1620			E	
HUAN	09	1610	1617	1625	N09	E85	.994	14943	16.0	15	-N	1	C	1617	30			
HTPR	09	1612	1616	1624	N08	E80	.982	14943	15.7	12	-F		C	1616	20	.5		
GRP64520	09	1630+1	1634	1703	N08	E84	.993	14943	16.0	33	1N						FIRUY	
MCMA	09	1630		1900D	N07	E87	.998	14943	16.2	150D	2B		C	1645			FIRU	
HUAN	09	1631		1703	N09	E85	.994	14943	16.1	32	1B	1	C				Y	
HTPR	09	1631	1634	1655	N08	E80	.982	14943	15.7	24	-F		C	1634	30	.8		
	09	2017	2037	NO FLARE PATROL														
	09	2106	2132	NO FLARE PATROL														
521 TACH	10	0510	0514	0550	N08	E75	1.000	14943	15.8	67	1N		C				E	YS
522 CULG	10	0548	0558U	0635	N06	E69	.930	14943	15.4	47	-F		C	0558	60			YS
GRP64523	10	0655>9	0701	0852	N06	E69	.930	14943	15.5	117	-N						DK	
			0747+2															
CULG	10	0655	0701	0732D	N06	E69	.930	14943	15.5	37D	-N		P	0701	70			
KANZ	10	0730	0749	0855	N06	E70	.937	14943	15.6	85	-F						T K	
MONT	10	0732E	0747	0849	N06	E69	.930	14943	15.5	77D	-N		C	0747	50		D	
GRP64524	10	0800+1	0804+0	0808	N26	W49	.768	14930	6.7	8	-F							
KANZ	10	0800	0804	0807	N25	W51	.785	14930	6.5	7	-F		C				E	
MONT	10	0801	0804	0808	N27	W48	.761	14930	6.7	7	-F		C	0804	20		D	
525 KANZ	10	1118	1118	1124	N25	W52	.795	14930	6.6	6	-F		C					YS

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OBSERV-ATORY	OBSERVED UT				LOCATION					DURA-TION	IMPOR-TANCE	OBS.		MEASUREMENTS			REMARKS
	DATE	START	MAX. PHASE	END	APPROX LAT.	APPROX MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMR DAY			CONC	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR AREA Sq. Deg.	
	SEP									MIN.							
526 HTPR	10	1121	1127	1136	N06	E67	.917	14943	15.5	15	-F		C	1127	10	.2	Y5
GRP64527	10	1435+1	1437+0	1449	N05	E65	.903	14943	15.5	14	-F				20	.5	D
MCMA	10	1418E		1451D	N05	E66	.911	14943	15.5	33D	-N		P	1439	25	.6	D
MEUD	10	1435	1437	1439	N05	E64	.896	14943	15.4	4	-F		C	1437	20	.5	D
HTPR	10	1436	1437	1447	N05	E64	.896	14943	15.4	11	-F		C	1437	20	.4	
HUAN	10	1445E		1500	N05	E65	.903	14943	15.5	15D	-F	1	P				
528 HUAN	10	1850		1856	N06	E61	.871	14943	15.4	6	-F	1	C				E Y5
	10	1934	1937	NO FLARE PATROL													
	10	2035	2104	NO FLARE PATROL													
529 CULG	10	2132	2141	2210	N06	E59	.853	14943	15.3	38	-N		C	2141	20	.4	Y5
	11	0053	0058	NO FLARE PATROL													
	11	0104	0122	NO FLARE PATROL													
	11	0146	0148	NO FLARE PATROL													
530 CULG	11	0604	0606	0620	N14	E36	.588		14.0	16	-N		C	0606	20	.3	Y5
531 CATA	11	0855E	0855	0900D	N18	E50	.764	14942	15.1	5D	-B	1		0855	22	.4	Y5
532 MEUD	11	1043	1044	1045	N26	W61	.873	14930	6.9	2	-N		C	1044	30	.7	E Y5
533 MCMA	11	1201E		1300D	N15	E47	.727	14942	15.0	59D	-N	*	P	1221	125	1.9	E Y5
534 MCMA	11	1201E		1400	N07	E52	.783	14942	15.4	119D	-F		P	1215	60	1.0	E Y5
GRP64535	11	1300>9	1320+4 1350+3	1412D	N15	E47	.727	14942	15.1	72	-N						E
MCMA	11	1300	1320	1338D	N15	E46	.716	14942	15.0	38D	-N	*	C	1320	130	1.9	E
KANZ	11	1318	1324	1332	N15	E46	.716	14942	15.0	14	-N	*	C				
KANZ	11	1332	1353	1502	N15	E48	.739	14942	15.2	90	-N						
MCMA	11	1338	1350	1412D	N15	E48	.739	14942	15.2	34D	-N		C	1350	60	.9	E
GRP64536	11	1413+4	1420+1	1440D	N15	E46	.716	14942	15.0	27	-N				100	1.5	E
MCMA	11	1413	1420	1510	N15	E48	.739	14942	15.2	57	-B		C	1420	100	1.6	E
MEUD	11	1417	1421	1440	N16	E44	.693	14942	14.9	23	-N		C	1421	100	1.4	E
537 KANZ	11	1432	1440	1442	N07	E50	.761	14942	15.4	10	-N		C				Y5
GRP64538	11	1615+0	1619+0	1625	N26	W66	.908	14930	6.7	10	-N				40		D
MCMA	11	1615	1619	1624	N27	W68	.922	14930	6.6	9	-B		C	1619	30	.7	D
MEUD	11	1615	1619	1626	N26	W64	.895	14930	6.9	11	-N		C	1619	50		D
539 MCMA	11	1710	1712	1718	N15	E47	.727	14942	15.2	8	-N		C	1712	30	.5	D Y5
540 MCMA	11	1718	1721	1724	N15	E44	.692	14942	15.0	6	-N		C	1721	50	.7	E Y5
GRP64541	11	1849+1	1850+1	1856	N08	E48	.738	14943	15.4	7	-N				90	1.3	DR
RAMY	11	1849E	1851U	1856D	N09	E48	.738	14943	15.4	7D	-N	3	C		95		R
PALE	11	1850	1850	1907	N09	E50	.760	14943	15.5	17	-N	3	C		91		DE
MCMA	11	1850	1851	1855	N07	E46	.715	14943	15.2	5	-B		C	1851	40	.6	D
	11	1938	1952	NO FLARE PATROL													
	11	2016	2022	NO FLARE PATROL													
	11	2028	2031	NO FLARE PATROL													
	11	2124	2134	NO FLARE PATROL													
542 VORO	11	2211E		2228	N16	E42	.669	14942	15.1	17D	-B		P	2217	99	1.3	J Y5
543 VORO	11	2230E		2240	N06	E44	.691	14943	15.2	10D	-B		C	2231	90	1.2	CDJ Y5
544 VORO	11	2247	2252	2316D	N16	E42	.669	14942	15.1	29D	-B		P	2252	99	1.3	EJ Y5
	11	2300	2311	NO FLARE PATROL													
	11	2325	0021	NO FLARE PATROL													
	12	0023	0038	NO FLARE PATROL													
	12	0041	0045	NO FLARE PATROL													
GRP64545	12	0954+4	1001 1014+0	1028	N21	E42	.680	14943	15.6	34	-F				25	.4	E
MONT	12	0954	1001	1006	N18	E47	.731	14943	15.9	14	-F		C	1001	40		E
KANZ	12	0958	1014	1026	N21	E42	.680	14943	15.6	28	-F		C				
MONT	12	1007	1014	1029	N22	E42	.683	14943	15.6	22	-F		C	1014	20		D
CATA	12	1015E	1015	1015D	N22	E42	.683	14943	15.6		-N	1		1015	28	.4	

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OBSERV-ATORY	OBSERVED UT				LOCATION					DURA-TION	IMPOR-TANCE	OBS.		MEASUREMENTS			REMARKS	
	DATE	START	MAX. PHASE	END	APPROX LAT.	APPROX MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMR. DAY	MIN.		CONC.	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR AREA Sq. Deg.		
	12 SEP	1807	1948	NO FLARE PATROL														
	12	2001	2039	NO FLARE PATROL														
	12	2054	2104	NO FLARE PATROL														
	12	2158	2206	NO FLARE PATROL														
	12	2219	2222	NO FLARE PATROL														
546 VORO	13	0126	0128	0133	N17	E31	.527	14943	15.4	7	-B		C	0128	125	1.4	D	Y5
547 VORO	13	0212	0212	0218	N11	E38	.611	14943	15.9	6	-B		C	0212	45	.5	D	Y5
548 TACH	13	0530	0534	0550	N10	E36	.583	14943	15.9	20	-N		C	0539	88	1.1	E	Y5
549 CULG	13	0544	0554	0605	N28	W90	.998	14930	6.5	21	-N		C	0554	40			Y5
550 KANZ	13	0927E	0927	0927D	N10	E35	.569	14943	16.0		-B		C				D	Y5
GRP64551	13	1318+5	1322+1	1334	N10	E33	.541	14943	16.0	16	-N						D	
HTPR	13	1318	1322	1333	N11	E33	.541	14943	16.0	15	-F		C	1322	10	.1		
KANZ	13	1323	1323	1334	N10	E33	.541	14943	16.0	11	-B		C				D	
GRP64552	13	1455+1	1455+2	1507	N06	E21	.357	14943	15.2	12	-N				20	.2		
CATA	13	1455	1455	1510	N08	E21	.356	14943	15.2	15	-B	2		1455	28	.3		
HUAN	13	1456E		1501	N05	E21	.358	14943	15.2	5D	-F	1	P	1456	20	.2	D	
HTPR	13	1456	1457	1507	N05	E22	.374	14943	15.3	11	-F		C	1457	20	.2	E	
GRP64553	13	1548+1	1553	1610	N10	E32	.526	14943	16.1	22	-F							
HTPR	13	1548	1553	1612	N09	E32	.526	14943	16.1	24	-F		C	1553	20	.2	E	
HUAN	13	1549		1608	N11	E32	.527	14943	16.1	19	-F	1	C	1604	25	.3	D	
	13	1857	1915	NO FLARE PATROL														
	13	1953	2049	NO FLARE PATROL														
554 CULG	13	2333	2356	0010	N10	E27	.451	14943	16.0	37	-N		C	2356	25	.3		Y5
555 HTPR	14	0922E		0934	N07	E12	.206	14943	15.3	12D	-F		C	0925	10	.1		Y5
GRP64556	14	1311	1315	1329	N08	E17	.290	14943	15.8	18	-F							
ZURI	14	1311	1315	1333	N09	E18	.307	14943	15.9	22	-N		C	1315	130	1.4		
HTPR	14	1312E		1324	N08	E17	.290	14943	15.8	12D	-F		C	1314	10	.1		
GRP64557	14	1501>9	1529 1555	1615	N05	E07	.127	14943	15.2	74	-N							
ZURI	14	1501	1529	1539	N05	E09	.160	14943	15.3	38	-N		C	1529	50	.5		
HCMA	14	1527	1555	1640	N05	E07	.127	14943	15.2	73	-N		C	1555	60	.6	E	
WEND	14	1545E		1619D	N06	E07	.123	14943	15.2	34D	1N		P		400			
HUAN	14	1604E		1610D	N05	E07	.127	14943	15.2	6D	-F	1	P	1605	25	.3	D	
558 VORO	14	2147	2149	2159	N18	E37	.610	14948	17.7	12	-B		C	2149	45	.5	DGJ	Y5
GRP64559	15	0729+1	0730+1	0743	N15	W12	.244	14942	14.4	14	-F				20	.2	D	
HTPR	15	0729	0730	0744	N14	W12	.235	14942	14.4	15	-F		C	0730	20	.2		
MONT	15	0729	0731	0743	N15	W12	.244	14942	14.4	14	-F		C	0731	20		D	
KANZ	15	0730	0730	0743	N15	W12	.244	14942	14.4	13	-F		C				D,T	
GRP64560	15	0751+9	0802+1 0812	0830	N07	W01	.018	14943	15.3	39	-F						D	
MONT	15	0751	0803	0835	N08	W01	.022	14943	15.3	44	-F		C	0803	20		D	
KANZ	15	0758	0802	0830	N06	W01	.027	14943	15.3	32	-F		C				D	
HTPR	15	0800	0812	0830	N07	W02	.035	14943	15.2	30	-F		C	0812	10	.1		
GRP64561	15	1042+3	1051+0	1103D	N07	E03	.052	14943	15.7	21	-N							
MONT	15	1042	1051	1115D	N08	E01	.022	14943	15.5	33D	-F		C	1051	80			
ZURI	15	1045	1051	1103	N07	E05	.087	14943	15.8	18	-B		C	1051	30	.3		
GRP64562	15	1107+6	1115+2	1118D	N10	E07	.130	14943	16.0	11	-N				35	.4	E	
ZURI	15	1107	1117	1151	N10	E06	.114	14943	15.9	44	-B		C	1117	50	.5		
HTPR	15	1113	1115	1118	N10	E08	.146	14943	16.1	5	-F		C	1115	20	.2	E	
GRP64563	15	1115+0	1129+0	1146	N23	E88	.997	14951	22.1	31	-F							
ZURI	15	1115	1129	1151	N23	E87	.995	14951	22.0	36	-F		C	1129	20			
KANZ	15	1115	1129	1141	N24	E90	.999	14951	22.2	26	-N							
564 KANZ	15	1145	1148	1152	N17	W84	.183	14942	15.2	7	-N		C					Y5
565 ZURI	15	1319	1321	1359	N09	E05	.092	14943	15.9	40	-N		C	1321	40	.4		Y5
566 PALE	15	1855	1857	1901	N07	W03	.052	14943	15.6	6	-F	3	C		36		DE	Y5

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OBSERVATORY	OBSERVED UT				LOCATION					DURATION	IMPORTANCE	OBS.		MEASUREMENTS			REMARKS
	DATE SEP	START	MAX. PHASE	END	APPROX LAT.	APPROX MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMR DAY	MIN.		CONF.	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR AREA Sq. Deg.	
	15	2000	2004	NO FLARE PATROL													
	15	2040	2045	NO FLARE PATROL													
GRP64567	16	0033+1	0040+2	0135	N23	W05	.284	14942	15.6	62	-N				130	1.4	OG
CULG	16	0033	0042	0135	N24	W05	.300	14942	15.6	62	-N		C	0042	140	1.6	
VORO	16	0034	0040	0110D	N23	W06	.290	14942	15.6	36D	-B		C	0040	116	1.2	OG
	16	0112	0119	NO FLARE PATROL													
	16	0127	0134	NO FLARE PATROL													
	16	0137	0142	NO FLARE PATROL													
	16	0155	0221	NO FLARE PATROL													
568 CATA	16	0645	0645	0650	N17	W11	.251	14943	15.5	5	-N	2		0645	56	.6	H Y5
569 HTPR	16	0931	0932	0947	N16	W15	.294	14942	15.3	16	-F		C	0932	10	.1	Y5
GRP64570	16	0942	0944+1	1005	N09	W07	.125	14943	15.9	23	-F						
HTPR	16	0942	0944	0953	N08	W10	.173	14943	15.7	11	-F		C	0944	10	.1	
HTPR	16	0944	0945	1005	N11	W05	.109	14943	16.0	21	-F		C	0945	10	.1	
571 HTPR	16	1201	1203	1204	N18	W30	.517	14942	14.3	3	-F		C	1203	10	.1	Y5
572 HTPR	16	1202	1204	1215	N08	W17	.290	14943	15.2	13	-F		C	1204	10	.1	Y5
573 HTPR	16	1204	1207	1213	N13	W20	.350	14942	15.0	9	-F	*	C	1207	10	.1	Y5
574 HTPR	16	1244	1247	1250	N08	W17	.290	14943	15.3	6	-F		C	1247	10	.1	Y5
575 HTPR	16	1312	1318	1322	N17	W21	.386	14942	15.0	10	-F		C	1318	10	.1	Y5
576 HTPR	16	1343	1346	1403	N20	W23	.434	14942	14.8	20	-F		C	1347	10	.1	Y5
577 HTPR	16	1428	1430	1445	N08	W15	.257	14943	15.5	17	-F		C	1430	20	.2	Y5
578 HTPR	16	1510	1512	1520	N10	W17	.293	14943	15.4	10	-F		C	1512	10	.1	Y5
579 RAMY	16	1735E	1739	1753	N07	W20	.339	14943	15.2	18D	-N	4	C		190		FDE Y5
GRP64580	16	1803+0	1805+0	1830	N07	W16	.274	14943	15.6	27	-F				50	.5	
PALE	16	1803	1805	1830	N07	W16	.274	14943	15.6	27	-F	3	V		53		DE
PALE	16	1803	1805	1830	N07	W16	.274	14943	15.6	27	-F	3	C		53		DE
GRP64581	16	2123	2141+2 2256>9	0043	N07	W20	.339	14943	15.4	200	2N				820	8.7	FRUZ
CULG	16	2123	2141	2230D	N08	W20	.339	14943	15.4	67D	1N		C	2141	220	2.4	UZ
PALE	16	2140E	2307	0215	N07	W21	.356	14943	15.3	275D	2B	4	C		190		Z U
PALE	16	2140E	2143	0000	N07	W21	.356	14943	15.3	140D	2B	3	V		826		Z U
CULG	16	2230	2256	0050	N08	W20	.339	14943	15.4	140	2N		C	2256	765	8.2	UZ
MANI	16	2300E	2300U	0015	N08	W21	.356	14943	15.4	75D	2B	2		2300	850	9.4	ZF
VORO	16	2305E		2325D	N07	W20	.339	14943	15.5	20D	2N		P	2305	1102	12.0	
MITK	16	2306E		0105D	N06	W20	.340	14943	15.5	119D	2N		P	2312	570	6.2	R
	16	2203	2223	NO FLARE PATROL													
GRP64582	17	0240+5	0247+3	0300	N17	W28	.485	14942	15.0	20	-N				70	.8	U
CULG	17	0240	0250	0310	N18	W28	.490	14942	15.0	30	-N		C	0250	55	.6	
MITK	17	0241	0247	0300	N17	W28	.485	14942	15.0	19	-N		C	0247	90	1.1	E
PALE	17	0245	0247	0253	N16	W29	.496	14942	14.9	8	-F	3	C		73		U F
GRP64583	17	0624+6	0634+1	0652	N18	W38	.623	14942	14.4	28	-N						
CULG	17	0624	0634	0648	N19	W38	.626	14942	14.4	24	-F		C	0634	20	.2	
CATA	17	0630	0635	0655D	N17	W38	.620	14942	14.4	25D	-B	2		0635	56	.7	
GRP64584	17	0651+1	0654+0	0704	N08	W24	.404	14943	15.5	13	-F				30	.3	
CULG	17	0651	0654	0711	N08	W20	.339	14943	15.8	20	-F		C	0654	30	.4	
ATHN	17	0652	0654	0656	N09	W28	.466	14943	15.2	4	-N	1			33	.7	
585 CATA	17	1020	1020	1030	N09	W31	.511	14943	15.1	10	-N	2		1020	112	1.3	Y5
586 HCMA	17	1345E	1400	1420D	N08	W33	.540	14943	15.1	35D	-B		C	1400	100	1.3	E Y5
587 HCMA	17	1504E	1510	1523D	N18	W36	.597	14942	14.9	19D	-N		C	1510	60	.8	E Y5
588 HCMA	17	1514		1528D	N08	W33	.540	14943	15.2	14D	-N		C	1523	150	1.5	E Y5

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OBSERV-ATORY	OBSERVED UT				LOCATION					DURA-TION	IMPOR-TANCE	OBS.		MEASUREMENTS			REMARKS
	DATE	START	MAX. PHASE	END	APPROX LAT.	APPROX LON. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMP DAY			CONF.	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR AREA Sq. Deg.	
	SEP									MIN.							
GRP64589	17	2146+6	2158+2	2222	N06	W34	.556	14943	15.4	36	-N				50	.6	
VORO	17	2146E		22040	N06	W35	.570	14943	15.3	180	-B		P	2149	143	1.7	E
CULG	17	2151	2200	2210	N06	W35	.570	14943	15.3	19	-F		C	2200	30	.3	
PALE	17	2152	2158	2234	N07	W32	.526	14943	15.5	42	-F	3	C		70		FDE
GRP64590	18	0019+1	0035+5	0140	N07	W35	.570	14942	15.4	81	1N				360	4.4	FZ
PALE	18	0019	0035	00540	N07	W33	.541	14942	15.5	350	1B	3	V		368		Z F
CULG	18	0020	0040	0140	N08	W38	.611	14942	15.2	80	1N		C	0040	345	4.3	ZF
	18	0205	0210	NO FLARE PATROL													
591 PALE	18	0321	0325	0338	N01	W35	.580	14943	15.5	17	-F	3	V		120		FDE YS
GRP64592	18	0538+2	0542+2	0556	S26	E67	.956	14952	23.3	18	-F						D
CULG	18	0538	0544	0555	S27	E66	.953	14952	23.2	17	-F		C	0544	30		
TACH	18	0540	0542	05560	S25	E69	.963	14952	23.4	160	-N		C	0546	88		D
593 ATHN	18	0640	0642	0644	S23	E64	.936	14952	23.1	4	-B	1			33		YS
594 CULG	18	0654	0701	0715	N08	W40	.638	14943	15.3	21	-F		C	0701	20	.2	YS
595 RAMY	18	1228E	1230	12350	S25	E61	.924	14952	23.1	70	-N	4	C		32		DE YS
GRP64596	18	1256+2	1301+2	1308	N07	W38	.612	14943	15.7	12	-F				130	1.7	
HEUD	18	1256		1304	N07	W38	.612	14943	15.7	8	-F		C	1259	40	.5	
TEHR	18	1258	1301	1311	N10	W45	.702	14943	15.2	13	-F	3	C		127		
RAMY	18	1300E	1303	13080	N07	W37	.598	14943	15.8	80	-F	4	C		127		FDE
597 HEUD	18	1331	1332	1343	S25	E59	.912	14952	23.0	12	-F		C	1332	30	.7	D YS
598 HUAN	18	1822		1830	S26	E57	.902	14952	23.0	8	-F	1	C				E YS
GRP64599	18	1905+1	1911	1924	N07	W44	.690	14943	15.5	19	-F						
HUAN	18	1905		1919	N06	W45	.703	14943	15.4	14	-F	1	C				E
PALE	18	1906	1911	1929	N08	W44	.690	14943	15.5	23	-F	3	C		70		F
GRP64600	19	0004+0	0012+0	0044	N08	W47	.726	14943	15.5	40	-F				70	1.0	K
PALE	19	0004	0012	0042	N08	W47	.726	14943	15.5	38	-N	3	C		71		FDE
PALE	19	0004	0012	0042	N08	W47	.726	14943	15.5	38	-F	3	V		71		FDE
CULG	19	0023E	0023E	0105	N08	W45	.702	14943	15.6	420	-F		P	0023	40	.6	
CULG	18	2335	2341	0045	N08	W50	.761	14943	15.2	70	-F		C	2341	30	.5	K
GRP64601	19	0414	0421	0438	N09	W52	.782	14943	15.3	24	-N						E
CULG	19	0414	0421	0438	N09	W54	.803	14943	15.1	24	-F		C	0421	40	.6	
TACH	19	0416E		04270	N10	W50	.760	14943	15.4	110	1N		V	0416	176	2.8	E
602 ATHN	19	0753E	0756	0805	S26	E48	.840	14952	22.9	120	-F	1			33	1.0	YS
GRP64603	19	0955E	1038+7	1207	N08	W57	.834	14943	15.1	132	3B						FZ
CATA	19	0955E	1045	11250	N05	W57	.836	14943	15.1	900	3B	2		1045	843	15.8	
KANZ	19	1006D	1045	1205	N08	W57	.834	14943	15.1	1190	3B		C				
ATHN	19	1027	1039	12000	N10	W53	.793	14943	15.5	930	2B	1			672	15.3	
RAMY	19	1028E	1038	12080	N08	W58	.843	14943	15.1	1000	3B	3	C		1368		Z F
604 ATHN	19	1007E	1016	1026	S26	E48	.840	14952	23.0	190	-F	1			82	2.4	YS
605 RAMY	19	1351E	1359U	14090	N08	W57	.834	14943	15.3	180	-N	4	C		127		FDE YS
606 RAMY	19	1534E	1538	15550	S23	E46	.810	14952	23.1	210	-N	4	C		95		FDE YS
607 CULG	20	0024	0029	0045	N12	W64	.892	14943	15.2	21	-N		C	0029	30	.6	YS
608 PALE	20	0024E	0029	0037	S24	E40	.765	14952	23.0	130	-F	2	V		25		DE YS
GRP64609	20	0251>9	0354 0615	0847	N09	W59	.852	14943	15.7	356	2N						FI
CULG	20	0251	0354	07420	N10	W58	.842	14943	15.8	2910	3N		C	0354	840	15.1	I
MITK	20	0302		03150	N12	W55	.813	14943	16.0	130	1N		C	0315	210	3.7	F
TACH	20	0344E		06440	N11	W59	.851	14943	15.7	1800	3F		C	0347	618	12.8	BF
MITK	20	0429E		06500	N11	W57	.832	14943	15.9	1410	2N		C	0429	480	8.6	F
CATA	20	0605E	0615	06500	N08	W60	.861	14943	15.8	450	1B	2		0615	224	4.6	
MONT	20	0714E	0714	0847	N07	W62	.879	14943	15.7	930	1N		C	0714	250		B
610 MONT	20	0849	0850	0853	S25	E33	.712	14952	22.8	4	-F		C	0850	20		D YS
611 HUAN	20	1632	1634	1636	N11	W73	.951	14943	15.2	4	-F	1	C	1634	25		E YS

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OBSERV-ATORY	OBSERVED UT				LOCATION					DURA-TION	IMPOR-TANCE	OBS.		MEASUREMENTS			REMARKS	
	DATE SEP	START	MAX. PHASE	END	APPROX LAT.	APPROX MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMR DAY	MIN.		COND	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR AREA Sq. Deg.		
612 PALE	20	1753	1755	1801	N08	W70	.935	14943	15.5	8	-F	3	V		22		FDE	Y5
GRP64613	20	1838+0	1842	1850	N10	W73	.952	14943	15.3	12	-N							
PALE	20	1838	1842	1850	N10	W71	.941	14943	15.5	12	-N	3	V		60		FDE	
HUAN	20	1838		1841D	N11	W75	.961	14943	15.2	3D	-N	1	P					
GRP64614	20	2242+4	2250 2307+1	2318	S23	E28	.652	14952	23.0	36	-N				60	.8	DJK	
VORO	20	2242	2308	2319	S22	E30	.661	14952	23.2	37	-B		C	2308	81	1.1	DJK	
PALE	20	2246	2250	2313	S23	E27	.644	14952	23.0	27	-F	3	V		27		DE	
CULG	20	2300	2307	2318	S24	E28	.661	14952	23.1	18	-F		C	2307	40	.5		
GRP64615	20	2257>9	2303+8	2324	N10	W74	.957	14943	15.4	27	-N				40		JL	
CULG	20	2257	2307	2324	N11	W74	.956	14943	15.4	27	-F		C	2307	35			
VORO	20	2301	2303	2324	N10	W75	.962	14943	15.3	23	-B		C	2303	63	2.2	DJL	
PALE	20	2308	2311	2326	N08	W73	.952	14943	15.5	18	-F	3	V		30		FDE	
616 VORO	21	0106	0108	0113	N05	W76	.968	14943	15.3	7	-B		C	0108	63	2.2	DJL	Y5
	21	0212	0213	NO FLARE PATROL														
	21	0221	0226	NO FLARE PATROL														
617 MITK	21	0345	0346	0348	N05	W77	.972	14943	15.4	3	-F		C	0346	50		E	Y5
618 HTPR	21	0635E	0636	0644	N10	W80	.982	14943	15.3	9D	-F		C	0636	10			Y5
619 HTPR	21	0723	0726	0730	N10	W80	.982	14943	15.3	7	-F		C	0726	10		E	Y5
620 MONT	21	0804	0818	0830	N13	W81	.984	14943	15.3	26	-F		C	0818	40		E	Y5
621 MONT	21	0821	0822	0826	N18	W88	.997	14942	14.7	5	-F		C	0822	20		D	Y5
GRP64622	21	0834+2	0836+1	0840	S23	E22	.602	14952	23.0	6	-F				45	.6	D	
MONT	21	0834	0837	0841	S24	E22	.613	14952	23.0	7	-F		C	0837	40		D	
ZURI	21	0836	0836	0838	S23	E23	.610	14952	23.1	2	-N		C	0836	50	.7		
GRP64623	21	0911>9	0932+1	0944	N11	W83	.990	14943	15.2	33	-N				30		E	
MONT	21	0911	0933	1012D	N13	W82	.987	14943	15.2	61D	-F		C	0933	40		E	
ZURI	21	0922	0932	0944	N09	W85	.995	14943	15.0	22	-B		C	0932	30			
HTPR	21	0929	0933	0936	N10	W82	.988	14943	15.2	7	-F		C	0933	10		E	
624 MONT	21	1000	1002	1012D	N18	W89	.999	14942	14.7	12D	-F		C	1002	20			Y5
GRP64625	21	1036+4	1040+5	1101	N09	W84	.993	14943	15.1	25	-F				20			
HTPR	21	1036	1045	1101	N10	W84	.992	14943	15.1	25	-F		C	1045	10			
CATA	21	1040	1040	1050D	N09	W85	.995	14943	15.1	10D	-F	2		1040	20			
626 HTPR	21	1435	1436	1445	N25	E04	.314	14951	21.9	10	-F		C	1436	10	.1		Y5
627 HTPR	21	1436	1439	1454	S23	E21	.594	14952	23.2	18	-F		C	1439	10	.1		Y5
GRP64628	21	1448+0	1450+1	1453	N17	W90	.999	14942	14.9	5	-F				25		D	
HUAN	21	1448	1451	1452	N18	W90	.999	14942	14.9	4	-F	1	C	1451	25		D	
HTPR	21	1448	1450	1453	N16	W90	.999	14942	14.9	5	-N		C	1450	20			
629 HTPR	21	1458	1503	1522	S23	E21	.594	14952	23.2	24	-F		C	1503	10	.1		Y5
630 HUAN	21	1707E		1716	N11	W87	.997	14943	15.2	9D	-N	1	P	1707	20		C,D	Y5
	21	1956	2055	NO FLARE PATROL														
631 CULG	21 IMP.1 NO. VOR01	2235	2253	2335	N19	W90	.999	14942	15.2	60	?F		C	2253	50			Y5
632 CULG	22	0120	0124	0210	N11	W90	1.000	14943	15.3	50	1N		C	0124	60		K	Y5
633 CULG	22	0548	0555	0608	S24	E14	.558	14952	23.3	20	-F		C	0555	30	.3		Y5
GRP64634	22	0617	0625	0649	N11	W90	1.000	14943	15.5	32	1F							
CULG	22	0617	0625	0703	N12	W90	1.000	14943	15.5	46	1F		C	0625	50			
ATHN	22	0626E	0626	0635	N10	W90	1.000	14943	15.5	9D	-N	1						
635 CULG	22	0624	0631	0648	S24	E13	.553	14952	23.2	24	-F		C	0631	25	.3		Y5

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OBSERV-ATORY	OBSERVED UT				LOCATION					DURATION	IMPORTANCE	OBS.		MEASUREMENTS			REMARKS	
	DATE	START	MAX. PHASE	END	APPROX LAT.	APPROX LON. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMP. DAY	MIN.		CONC	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR AREA Sq. Deg.		
	SEP																	
GRP64636	22	0726+4	0730+4	0752	S23	E11	.529	14952	23.1	26	-N				140	1.6		
CULG	22	0726	0730	0742D	S24	E13	.553	14952	23.3	16D	-N		P	0730	100	1.2		
ATHN	22	0730	0734	0743	S24	E10	.538	14952	23.1	13	-N	1			98			
BUCA	22	0730E		0800	S21	E11	.501	14952	23.1	30D	1N		C	0731	214	2.5	C	
637 WEND	22	1212E		1236D	S22	E09	.506	14952	23.2	24D	?F		V		300			Y5
	IMP.1 NO 1 HTPR2																	
	22	1417	1426	NO FLARE PATROL														
	22	1751	1824	NO FLARE PATROL														
	22	1940	1951	NO FLARE PATROL														
	22	2005	2047	NO FLARE PATROL														
	23	0205	0215	NO FLARE PATROL														
638 CULG	23	0518	0537	0601	S28	E00	.574	14952	23.2	43	-N		C	0537	45	.5	F	Y5
639 CULG	23	0648	0657	0720	S28	E01	.574	14952	23.4	32	-F		C	0657	80	1.0	F	Y5
640 HTPR	23	1029	1037	1058	S20	W05	.461	14952	23.1	29	-F		C	1037	20	.2	E	Y5
	23	1714	1719	NO FLARE PATROL														
	23	1812	1815	NO FLARE PATROL														
	23	1852	1855	NO FLARE PATROL														
	23	1918	1959	NO FLARE PATROL														
	23	2034	2048	NO FLARE PATROL														
	23	2112	2119	NO FLARE PATROL														
	23	2120	2131	NO FLARE PATROL														
641 CULG	23	2132	2145	2205	S23	W08	.516	14952	23.3	33	-F		C	2145	90	1.1		Y5
GRP64642	23	2339+1	2352+5	0019	S27	W18	.619	14952	22.6	40	-N				80	1.0	J	
CULG	23	2339	2357	0025	S27	W18	.619	14952	22.6	46	-F		C	2357	65	.8		
VORO	23	2340	2352	0013	S27	W18	.619	14952	22.6	33	-B		C	2352	99	1.2	J	
643 CULG	24	0204	0215	0245	S23	E85	.999	14962	30.5	41	1N		C	0215	60			Y5
644 CULG	24	0210	0213	0218	S23	W22	.601	14952	22.4	8	-N		C	0213	50	.6		Y5
645 TEHR	24	0446E	0449	0508	S20	E61	.912	14959	28.8	22D	-F	4	C		127			Y5
646 CATA	24	1100	1100	1100D	N15	E90	1.000	14963	1.2		-F	2		1100	28			Y5
	24	1554	1631	NO FLARE PATROL														
647 HUAN	24	1655E		1705	N13	E90	1.000	14963	1.5	10D	-F	1	P	1655	20		C,D	Y5
	24	1832	1840	NO FLARE PATROL														
	24	1855	1914	NO FLARE PATROL														
648 HUAN	24	1938		1943D	N14	E88	.998	14963	1.4	5D	-N	2	P	1943	25		D	Y5
GRP64649	24	1941+2	1946	1950	S19	E73	.972	14962	30.3	9	-F				30		D	
HUAN	24	1941		1947D	S21	E77	.986	14962	30.6	6D	-N	1	P	1946	25		D	
PALE	24	1943	1946	1950	S18	E69	.954	14962	30.0	7	-F	3	C		29		DE	
	24	1943	1946	NO FLARE PATROL														
	24	1947	1952	NO FLARE PATROL														
	24	2010	2015	NO FLARE PATROL														
	24	2029	2130	NO FLARE PATROL														
	25	0132	0150	NO FLARE PATROL														
	25	0155	0214	NO FLARE PATROL														
	25	0217	0232	NO FLARE PATROL														
650 CULG	25	0433	0455	0510	N12	E88	.998	14963	1.8	37	-B		C	0455	30			Y5
651 CULG	25	0627	0645	0700	S28	W27	.690	14952	23.2	33	-F		C	0645	50	.7	U	Y5
GRP64652	25	0911+0	0922+3 1005	1013	S21	W32	.670	14952	23.0	62	1N				200	2.6	FR	
TEHR	25	0911	0922	0928D	S21	W32	.670	14952	23.0	17D	-F	3	V		190		F R	
TEHR	25	0911	0922	1013	S21	W32	.670	14952	23.0	62	-F	3	C		190		F R	
CATA	25	0920E	0925	0935D	S27	W24	.658	14952	23.6	15D	1B	2		0925	224	3.1		
WEND	25	0925E		1008	S22	W30	.660	14952	23.1	43D	1N		P		400			
KHAR	25	1000E	1005	1040D	S20	W33	.672	14952	22.9	40D	1F		C	1005	145	2.1	E	
	25	1048	1050	NO FLARE PATROL														
	25	1100	1120	NO FLARE PATROL														

Hα SOLAR FLARES

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OBSERV-ATORY	OBSERVED UT				LOCATION					DURA-TION	IMPOR-TANCE	OBS.		MEASUREMENTS			REMARKS	
	DATE SEP	START	MAX. PHASE	END	APPROX LAT.	APPROX MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMR DAY	MIN.		COND.	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR AREA Sq. Deg.		
	25	1205	1207	NO FLARE PATROL														
GRP64653	25	1210E	1215	1242	S27	W33	.727	14952	23.0	32	-F				90	1.3	EHLU	
KHAR	25	1210E	1215	1225D	S26	W35	.735	14952	22.9	15D	-F		P	1215	110	1.6	E	
MCMA	25	1214E		1242	S28	W31	.720	14952	23.2	28D	-N		C	1216	75	.9	BHLU	
654 MCMA	25	1237	1246	1255	N13	E88	.998	14963	2.1	18	-F		C	1246			E	YS
655 MCMA	25	1255	1300	1325	S28	W31	.720	14952	23.2	30	-N		C	1300	60	.7	E	YS
656 MCMA	25	1316	1325	1340D	N28	E03	.362	14957	25.8	24D	-N		C	1325	50	.5	E	YS
657 MCMA	25	1319	1321	1329	N13	E86	.995	14963	2.0	10	-N		C	1321			D	YS
GRP64658	25	1334	1349+1	1405D	N13	E83	.989	14963	.8	31	1B						XZ	
MCMA	25	1334	1349	1405D	N13	E84	.992	14963	1.9	31D	1B		C	1349			EX	
RAMY	25	1339E	1350	1405D	N14	E82	.987	14963	1.7	26D	1B	3	C				F Z	
659 KANZ	25	1434E	1434	1445	N13	E82	.987	14963	1.8	11D	-F		C				B	YS
GRP64660	25	1655	1658+3	1725	N13	E79	.977	14963	.6	30	-B							
HUAN	25	1655		1734	N13	E78	.974	14963	1.6	39	-N	1	P				E	
RAMY	25	1658E	1701	1716	N14	E80	.980	14963	1.7	18D	-B	3	C				DE	
MCMA	25	1658E	1658	1702D	N12	E80	.981	14963	1.7	4D	-B		C	1658			D	
GRP64661	25	1900+1	1902+0	1906	N28	W01	.359	14957	25.7	6	-F				50	.5		
HUAN	25	1900	1902	1908	N28	E00	.359	14957	25.8	8	-N	1	C	1902	60	.6	E	
PALE	25	1901	1902	1903	N28	W02	.360	14957	25.6	2	-F	3	V		40		FDE	
	25	2107	2132	NO FLARE PATROL														
662 PALE	26	0036E	0039U	0040D	N15	E76	.965	14963	1.7	4D	-F	3	V		40		DE	YS
663 CULG	26	0137	0149	0220	N14	E78	.973	14963	1.9	43	1N		C	0149	110			YS
664 CULG	26	0145	0147	0155	N24	W36	.622	14951	23.4	10	-F		C	0147	20	.2		YS
665 CULG	26	0220	0237	0305	S22	W42	.769	14952	22.9	45	-F		C	0237	60	1.0		YS
666 CULG	26	0355	0420	0440	S28	W41	.796	14952	23.1	45	-F		C	0420	85	1.4		YS
GRP64667	26	0525	0538 0617	0651D	S28	W42	.804	14952	23.1	86	?N							
CULG	26 IMP.1 NO	0525	0538 TACH1	0620	S28	W42	.804	14952	23.1	55	N		C	0538	225	3.8		
CULG	26	0600	0617	0651D	S21	W42	.764	14952	23.1	51D	-F		C	0617	90	1.4		
668 HTPR	26	0753	0802	0830	S24	W50	.846	14952	22.6	37	-F		C	0802	10	.2		YS
669 HTPR	26	0836	0839	0859	N14	E70	.933	14963	1.6	23	-F		C	0839	10	.2		YS
GRP64670	26	1153E	1205	1257D	S21	W45	.791	14952	23.1	64	-N				70	1.1	E	
ZURI	26	1153E	1205	1257D	S20	W44	.777	14952	23.2	64D	-B		P	1205	60	1.5		
KHAR	26	1200E		1200D	S19	W47	.799	14952	23.0		-F		C	1200	110	1.9	BE	
HTPR	26	1201E		1220D	S24	W45	.806	14952	23.1	19D	-F		C	1208	60	.8	E	
MEUD	26	1204E		1216D	S23	W44	.792	14952	23.2	12D	-F		C	1207	60	1.0	E	
671 MCMA	26	1423	1425	1455	S18	E42	.747	14962	29.7	32	-F		C	1425	20	.3	E	YS
672 MCMA	26	1435	1445	1515	N28	W10	.392	14957	25.9	40	-N		C	1445	50	.5	E	YS
673 HUAN	26	1816		1823	S21	E45	.791	14962	30.1	7	-F	1	C				E	YS
674 MCMA	26	1845E		1858	S21	E44	.782	14962	30.1	13D	-N		P	1845	25	.4	E	YS
GRP64675	26	1858>9	1902 1912+3	1929	S24	W49	.838	14952	23.1	31	-N				120	2.0	FKLU	
MCMA	26	1858	1902	1910	S27	W50	.858	14952	23.0	12	-N		C	1902	20	.4	DL	
MCMA	26	1908	1912	1931D	S22	W52	.853	14952	22.9	23D	-B		C	1912	100	1.7	FKL	
PALE	26	1909	1915	1926	S24	W48	.830	14952	23.2	17	-F	3	V		145		U F	
MCMA	26	1913		1931D	S28	W50	.862	14952	23.1	18D	-B		C	1920	80	1.3		
676 PALE	26	1934	1937	1944	S24	W48	.830	14952	23.2	10	-F	3	V		73		U F	YS
	26	2003	2018	NO FLARE PATROL														
	26	2101	2132	NO FLARE PATROL														

Hα SOLAR FLARES

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OBSERV-ATORY	OBSERVED UT				LOCATION					DURA-TION	IMPOR-TANCE	OBS.		MEASUREMENTS			REMARKS	
	DATE SEP	START	MAX. PHASE	END	APPROX LAT.	APPROX MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMR DAY	MIN.		COND	TYPE	TIME UT	MEAS. AREA Mil. of Disk	CORR AREA Sq. Deg.		
677 CULG	26	2139	2143	2153	S20	W54	.862	14952	22.9	14	-F		C	2143	40	.8		Y5
678 CULG	26	2200	2204	2235	N28	W15	.429	14957	25.8	35	-F		C	2204	40	.4		Y5
GRP64679	26	2208	2212	2305	S21	E42	.764	14962	30.1	57	-N						EGHJ	
CULG	26	2208	2212	2300	S22	E42	.769	14962	30.1	52	-F		C	2212	40	.6		
VORO	26	2241E		2310	S20	E42	.758	14962	30.1	29D	-B		P	2244	108	1.6	EGHJ	
680 CULG	26	2335	2339	2357	S23	W60	.912	14952	22.5	22	-F		C	2339	20	.5		Y5
GRP64681	27	0113+2	0135+5	0157	S21	E41	.754	14962	30.1	44	-N						EGJ	
VORO	27	0113	0135	0153	S21	E42	.764	14962	30.2	40	1N		C	0135	179	2.7	EGJ	
CULG	27	0115	0140	0200	S22	E40	.751	14962	30.1	45	-N		C	0140	40	.6		
682 CULG	27	0442	0446	0458	S24	W88	1.000	14964	20.6	16	-F		C	0446	40			Y5
GRP64683	27	0517+0	0522+1	0558	S21	E36	.707	14962	29.9	41	-F				50	.7	EG	
CULG	27	0517	0522	0558	S22	E36	.714	14962	29.9	41	-N		C	0522	60	.9		
HITK	27	0517	0523	0538D	S21	E37	.717	14962	30.0	21D	-F		C	0523	50	.7	EG	
684 HTPR	27	0656E		0705	N14	E58	.842	14963	1.6	9D	-F		C	0659	20	.3	E	Y5
685 HTPR	27	0820	0832	0845	S22	E38	.733	14962	30.2	25	-F		C	0832	20	.2		Y5
GRP64686	27	0845+1	0849+1	0854	S23	W58	.899	14952	23.0	9	-F							
MONT	27	0845	0850	0854	S23	W57	.893	14952	23.1	9	-N		C	0850	70			
HTPR	27	0846	0849	0853	S24	W59	.908	14952	22.9	7	-F		C	0849	20	.3		
687 MONT	27	0938	0940	0943	S23	W57	.893	14952	23.1	5	-F		C	0940	20		D	Y5
688 MONT	27	1011	1017	1032	N14	E58	.842	14963	1.8	21	-N		C	1017	60		E	Y5
689 MONT	27	1106	1118	1145D	N14	E58	.842	14963	1.8	39D	-N		C	1118	60			Y5
690 MONT	27	1108	1120	1145D	S25	W86	1.000	14964	21.0	37D	-F		C	1120	20		D	Y5
691 HTPR	27	1230	1241	1253	S23	W86	1.000	14964	21.1	23	-F		C	1241	10			Y5
692 ZURI	27	1339E	1355	1429	S22	W82	.997	14964	21.4	51D	-N		P	1355	20			Y5
GRP64693	27	1406+1	1417+5	1455	S20	E31	.652	14962	29.9	49	-F				35	.5	E	
MCMA	27	1406	1422	1505	S21	E32	.669	14962	30.0	59	-N		C	1422	50	.6	E	
ZURI	27	1407	1417	1445	S20	E31	.652	14962	29.9	38	-F		C	1417	20	.3		
GRP64694	27	1435+2	1437+5	1447	S22	W85	.999	14964	21.2	12	-F				15			
ZURI	27	1435	1437	1445	S22	W82	.997	14964	21.5	10	-N		C	1437	20			
HTPR	27	1437	1442	1448	S23	W88	1.000	14964	21.0	11	-F		C	1442	10	.2		
GRP64695	27	1501+8	1509 1517	1526	S21.	W84	.999	14964	21.3	25	-F						D	
ZURI	27	1501	1509	1533	S22	W82	.997	14964	21.5	32	-N		C	1509	10			
HUAN	27	1509	1517	1518	S21	W87	1.000	14964	21.1	9	-F	1	C	1517	20		D	
GRP64696	27	1531+0	1544	1558	N14	E54	.804	14963	.7	27	-N				40	.7	E	
ZURI	27	1531	1544	1553D	N14	E54	.804	14963	1.7	22D	-N		P	1544	40	.7		
HUAN	27	1531		1554	N14	E55	.813	14963	1.8	23	-F	1	C				E	
MCMA	27	1537E		1602D	N14	E54	.804	14963	1.7	25D	-B		C	1548	40	.7	E	
697 HUAN	27	1759		1837	S21	W87	1.000	14964	21.2	38	-F	1	C					Y5
698 PALE	27	1822	1832	1850D	N15	E50	.762	14963	1.5	28D	-N	3	C		44		FDE	Y5
	27	1950	202E	NO FLARE PATROL														
GRP64699	27	2150+0	2155+0	2220	N15	E48	.740	14963	.5	30	-F				50	.8		
PALE	27	2150	2155	2220	N15	E48	.740	14963	1.5	30	-F	3	C		51		FDE	
PALE	27	2150	2155	2220	N15	E48	.740	14963	1.5	30	-F	3	V		51		FDE	
GRP64700	27	2329E	2349 2410	0118	N15	E47	.728	14963	.5	109	-N							
MANI	28	0005E	0010U	0118D	N16	E48	.741	14963	1.6	73D	-N	2		0010	130	2.0		
PALE	27	2329E	2439	0120	N15	E47	.728	14963	1.5	111D	-N	3	C		163		FDE	
PALE	27	2329E	2349	0008	N15	E47	.728	14963	1.5	39D	-F	3	V		113		FDE	
701 PALE	28	0137	0139	0230	N15	E45	.705	14963	1.4	53	-F	3	C		131		FDE	Y5
702 CULG	28	0208	0216	0235	S22	W67	.949	14952	23.1	27	-F		C	0216	20			Y5

Hα SOLAR FLARES

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OBSERV-ATORY	OBSERVED UT				LOCATION					DURA-TION	IMPOR-TANCE	OBS.		MEASUREMENTS			REMARKS	
	DATE SEP	START	MAX. PHASE	END	APPROX LAT.	APPROX MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMP. DAY	MIN.		CONC	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR. AREA Sq. Deg.		
703 CULG	28	0230	0243	0257	S32	E29	.740	14966	30.3	27	-F		C	0243	20	.3		Y5
704 CULG	28 IMP-1	0541 NO	0550 TACH1	0605	S27	W85	1.000	14964	21.9	24	?N		C	0550	100			Y5
GRP64705	28	0810>9	0815 0825	0851	S22	W90	1.001	14964	21.6	41	-F						D	
MONT	28	0810E	0815	0841	S23	W90	1.001	14964	21.6	31D	-F		C	0815	20		D	
CATA	28	0825	0825	0900D	S22	W90	1.001	14964	21.6	35D	-F	2		0825	56			
GRP64706	28	1010	1015	1034	S22	W90	1.001	14964	21.7	24	-F				25		D	
CATA	28	1010	1015	1035	S21	W90	1.001	14964	21.7	25	-F	2		1015	28			
MONT	28	1019E	1019	1033	S23	W90	1.001	14964	21.7	14D	-F		C	1019	20		D	
707 KANZ	28	1439	1443	1448	N14	E41	.655	14963	1.7	9	-F		C					Y5
708 KANZ	28	1509		1509D	N13	E42	.666	14963	1.8		-F		C					Y5
709 HUAN	28	1821		1830	N17	E37	.605	14963	1.5	9	-F	1	C	1822	40	.5		Y5
710 PALE	29	0058	0102	0117	N15	E34	.564	14963	1.6	19	-F	3	C		33		FOE	Y5
711 PALE	29	0206	0218	0220	N15	E33	.550	14963	1.6	14	-F	3	C		41		FOE	Y5
GRP64712	29	0620	0627+3 0737	0741	N15	E31	.522	14963	.6	81	-N						F	
CULG	29	0620	0630	0720	N14	E31	.519	14963	1.6	60	-N		C	0630	40	.5		
TEHR	29	0623E	0627	0634	N16	E30	.511	14963	1.5	11D	-N	3	C		159		F	
BUCA	29	0702E		0805	N14	E31	.519	14963	1.6	63D	-N		P	0710	107	1.3		
KANZ	29	0726E	0737	0801	N15	E31	.522	14963	1.6	35D	-F		C					
713 KANZ	29	0916		0916D	N12	E28	.471	14963	1.5		-F		C				D	Y5
GRP64714	29	1114	1126+1	1146	N14	E31	.519	14963	.8	32	-F							
MONT	29	1114	1126	1146	N15	E31	.522	14963	1.8	32	-F		C	1126	40		E	
KANZ	29	1123E	1127	1146	N14	E31	.519	14963	1.8	23D	-F		C				D	
	29	1905	1935	NO FLARE PATROL														
	29	2025	0031	NO FLARE PATROL														
	30	0034	0105	NO FLARE PATROL														
	30	0110	0145	NO FLARE PATROL														
	30	0155	0207	NO FLARE PATROL														
	30	0214	0229	NO FLARE PATROL														
	30	0234	0242	NO FLARE PATROL														
715 CULG	30	0315E	0321	0334D	N13	E21	.368	14963	1.7	19D	-N		P	0321	80	.8		Y5
716 TEHR	30	0612	0619	0622D	N14	E20	.357	14963	1.8	10D	-F	3	V		190		U F	Y5
717 MONT	30	0758	0800	0805	N16	W45	.707	14968	27.0	7	-F		C	0800	20		D	Y5
GRP64718	30	1111+2	1115+2	1123	N16	E14	.284	14963	.5	12	-N							
ZURI	30	1111	1115	1123	N17	E13	.281	14963	1.4	12	-N		C	1115	20	.2		
MONT	30	1111	1117	1139	N16	E16	.312	14963	1.7	28	-N		C	1117	80		E	
KANZ	30	1113	1117	1123	N16	E14	.284	14963	1.5	18	-N		C				D	
719 ZURI	30	1249	1303	1317	N14	E13	.253	14963	1.5	28	-F		C	1303	20	.2		Y5
720 HUAN	30	1712		1713D	N17	E11	.256	14963	1.5	1D	-F	1	P				E	Y5
	30	1820	1828	NO FLARE PATROL														
	30	1858	1903	NO FLARE PATROL														
	30	1908	1916	NO FLARE PATROL														
	30	1942	2035	NO FLARE PATROL														
	30	2124	2134	NO FLARE PATROL														
GRP64721	30	2221+6	2228+0	2247	N17	W53	.795	14968	27.0	26	-N				70	1.2		
CULG	30	2221	2228	2258	N18	W54	.806	14968	26.9	37	-N		C	2228	80	1.3		
VORO	30	2227	2228	2235	N16	W53	.795	14968	27.0	8	-B		C	2228	63	1.0		
GRP64722	30	2300+2	2302+1	2314	S23	E47	.817	14970	3.5	14	-N				30	.5	D	
CULG	30	2300	2302	2320	S24	E47	.821	14970	4.5	20	-N	*	C	2302	25	.4		
VORO	30	2302	2303	2308	S22	E48	.820	14970	4.6	6	-B	*	C	2303	27	.4	D	

"Remarks":

A = Eruptive prominence whose base is less than 90° from central meridian.
B = Probably the end of a more important flare.
C = Invisible 10 minutes before.
D = Brilliant point.
E = Two or more brilliant points.
F = Several eruptive centers.
G = No visible spots in the neighborhood.
H = Flare accompanied by a high speed dark filament.
I = Active region very extended.
J = Distinct variations of plage intensity before or after the flare.
K = Several intensity maxima.
L = Existing filaments show signs of sudden activity.
M = White-light flare.
N = Continuous spectrum shows effects of polarization.
O = Observations have been made in the calcium II lines H and K.
P = Flare shows helium D_3 in emission.
Q = Flare shows the Balmer continuum in emission.
R = Marked asymmetry in Hα line suggests ejection of high velocity material.
S = Brightness follows disappearance of filament (same position).
T = Region active all day.
U = Two bright branches, parallel (||) or converging (Y).
V = Occurrence of an explosive phase: important and abrupt expansion in about a minute with or without important intensity increase.
W = Great increase in area after time of maximum intensity.
X = Unusually wide Hα line.
Y = System of loop-type prominences.
Z = Major sunspot umbra covered by flare.

SEPTEMBER 1977

DAILY FLARE INDICES
Includes all Flares

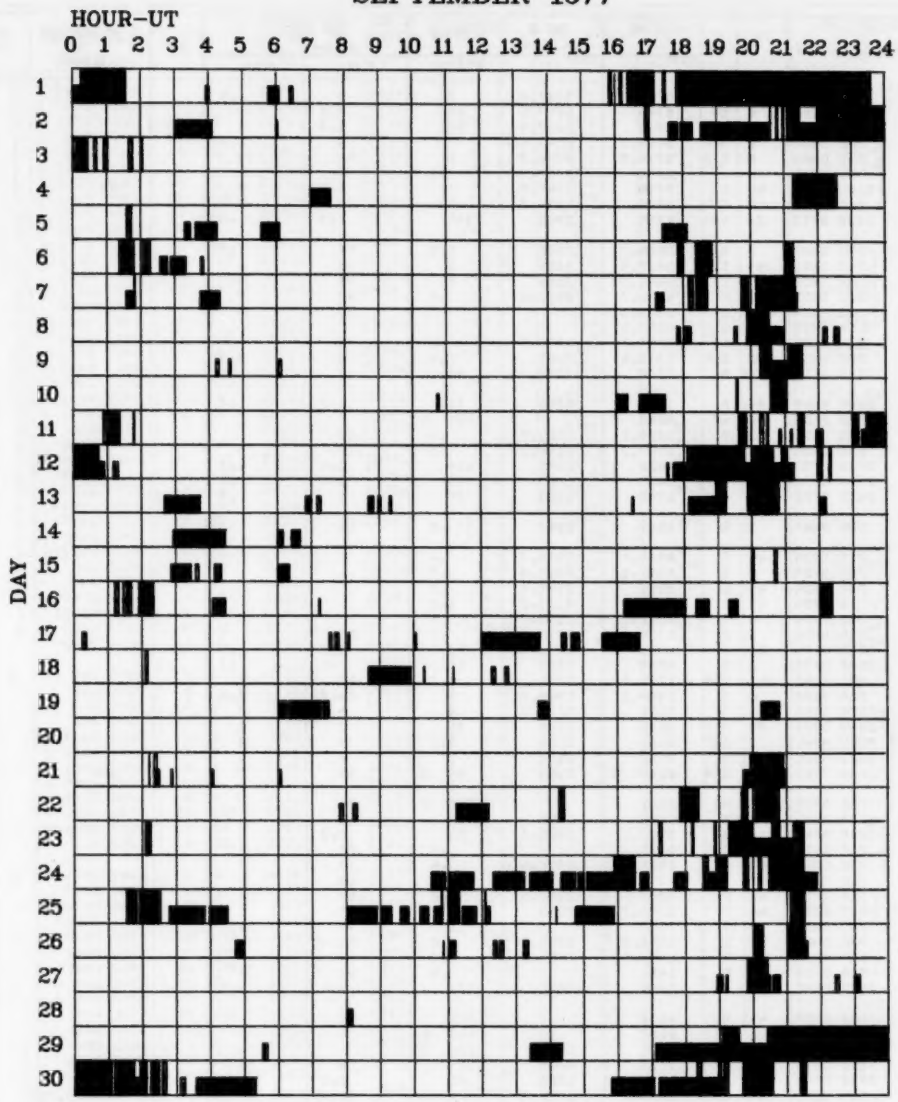
Date	Flare Index	HR. OBS.	Date	Flare Index	HR. OBS.	Date	Flare Index	HR. OBS.
770901	10.43	16.0	770911	34.31	21.9	770921	21.61	22.9
770902	4.14	21.3	770912	.35	21.0	770922	24.24	22.4
770903	5.49	23.3	770913	25.77	22.8	770923	16.89	22.4
770904	0.00	22.8	770914	19.21	24.0	770924	10.76	21.7
770905	5.28	23.9	770915	28.09	23.9	770925	47.61	22.3
770906	6.46	22.5	770916	426.55	22.9	770926	46.07	23.2
770907	7.91	22.1	770917	21.27	24.0	770927	24.30	23.4
770908	11.15	23.4	770918	90.20	23.9	770928	13.00	24.0
770909	10.52	23.2	770919	2339.59	24.0	770929	20.23	19.4
770910	9.21	23.5	770920	78.32	24.0	770930	32.76	20.9

When no Flare Index is given, it is 0 for that day.

INTERVALS OF NO FLARE PATROL OBSERVATION

FOR PRECEDING SOLAR FLARE TABLE

SEPTEMBER 1977



Observatories included in total patrol:

Athenes	Herstmonceux	Kharkov	McMath-Hulbert	Tashkent
Bucharest	Huancayo	Kiev	Meudon	Tehran
Catania	Istanboul	Kodaikanal	Mitaka	Upice
Culgoora	Kandilli	Locarno	Monte Mario	Voroshilov
Haute Provence	Kanzelhohe	Lvov	Palehua	Wendelstein
		Manila	Ramey	Zürich

Times of no flare patrol are shown by the shaded area for each day divided into times of no cinematographic patrol (bottom half of day) and times of neither visual nor cinematographic patrol (top half of day).

SOLAR RADIO EMISSION
OUTSTANDING OCCURRENCES

SEPTEMBER 1977

SEP 1977	FREQUENCY	STATION	TYPE	STARTING TIME UT	TIME OF MAXIMUM UT	DURATION MINUTES	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1} PEAK	FLUX DENSITY MEAN	INT	POLARIZATION OR REMARKS
1	2000	TYKW	45 C	0736	0737.6	7	2	.5		OR
	1470	BERL	4 SF	0745	0747.5	48	6.5			
	3000	BERL	1	0745	0747.5	52	2.9			
	536	ONDR	2 S/F	0746.3	0747.6	3	4	2.8		
	808	ONDR	4 S/F	0746.8	0746.8	2	48	10		
	1420	ARCE	3	0746	0747.5	3.5				
	2000	TYKW	45 C	0746	0747.5	3	4.5	2		OR
	930	BORD	46 C	0746	0746.8	3	28	4		
	2800	OTTA	20 GRF	1255	1543	195	.8	.4		
2	260	ONDR	4 S/F	0825.3	0826	1.5	24	3.3		
	240	OWIN	45 C	0825.5	0826	1	50	5		
	160	DWIN	45 C	0825.5	0826	1	30	3		
	237	TRST	41 F	0826.7	0826.8	.4	90	9 L		
	240	OWIN	8 S	0903.6			25	2		
	160	DWIN	8 S	0903.6						
	260	ONDR	3 S	1050.7	1050.7	.2	5			
	260	ONDR	2 S/F	1310.6	1311	1.2	8	2.3		
	2800	OTTA	240 R	1920	2000	40	1	.5		
3	2695	PENT	240 R	0845	0855	10	1.2	.6		
	260	ONDR	44 NS	0640 E		511 D	9			
	536	ONDR	3 S	1006.2	1006.2	.3	13			
	536	ONDR	8 S	1255.2	1255.2	.3	110			
	2800	OTTA	20 GRF	1420	1538	115	3.4	1.7		
	2800	OTTA	20 GRF	1630	1708	75	1.4	.7		
	2800	OTTA	20 GRF	1750	1800	25	1	.5		
4	536	ONDR	3 S	1003	1003	.2	14			
5	700	SYDN	45 C	0030.2	0030.3	.4				
	700	SYDN	8 S	0050.2	0050.5	.7				
	700	SYDN	45 C	0101	0101.1	.2				
	700	SYDN	45 C	0121	0121.2	1.1				
	700	SYDN	4 S	0122.2	0122.4	.6				
	536	ONDR	8 S	1339.2	1339.2	.3	72			
	2800	OTTA	240 R	1500	1550	50	1.2	.6		
	2800	OTTA	1 S	1630	1633	10	.6	.3		
	930	BORD	42 SER	1720.8	1721	1.9	42	2		
	245	SGMR	6 S	1944.2	1944.8	3	24.8	7.4		CONT
	2800	OTTA	1 S	2101	2103.2	4	6.4	3		
	2800	OTTA	29 PBI	2105	2105	25	2	1		
	2695	BCUL	3 GRF	2102	2104	8.5	6	2		
	1420	BCUL	3 S	2102	2103	2	2	1		
	1000	TYKW	42 SER	2140 U	2158	45 U	13	2 U		OSR
6	260	ONDR	44 NS	0641 E		513 D	74			
	1470	BERL	1 S	0902	0903	23	2			
	3000	BERL	2 SF	0902	0903.3	23	2.2			
	240	OWIN	45 C	0903		.6	20	3		
	930	BORD	46 C	0915	0915.4	.4	19	2		
	536	ONDR	42 SER	1047	1054.2	35	18			
	237	TRST	41 F	1252	1252.8	.8	140	10 L		
	930	BORD	46 C	1252.7	1253	.7	27	3		
	240	OWIN	45 C	1252		1	35	5		
	536	ONDR	8 S	1358.8	1358.8	.3	35			
	237	TRST	41 F	1454.5	1454.6	.3	57	9 L		
	240	OWIN	45 C	1454		.6	40	5		
	2695	PENT	240 R	2030	2410	230	4.4	2.2		
7	260	ONDR	44 NS	0630 E		550 D	20			
	240	DWIN	44 NS	0647 E		443 D		3		
	160	DWIN	44 NS	0705 E	0800	100 D		4		
	3100	CRIM	20 GRF	0724	0758	125	4	1		
	2800	OTTA	240 R	1617	1710	53	1.6	.9		
	245	SGMR	43 NS	1643.4	1821.9	379.6D	32.4			2,3,5,SWF
	200	HIRA	44 NS	2020 E	2215	130 D	10	5		D
	208	VORO	44 NS	2200		28		14		
	4995	BCUL	20 GRF	1703	1707	12	13	4		
	1420	BCUL	20 GRF	1705.5	1705.9	7.5	1			
	2800	OTTA	41 SER	1713	1720	37	6.4			
	2800	OTTA	22 GRF	1713	1720	15	6.4	2.9		
	2695	BCUL	45 C	1716	1720.5	8.5	9	2		
	2800	OTTA	22 GRF	1730	1732	20	3.8	1.5		
	1420	BOUL	1 S	1730	1732.5	3.5	2	1		
	2695	BCUL	1 S	1731	1732.5	4	2	1		
	2695	BOUL	1 S	1740.5	1742.5	2.5	2	1		
	1420	BOUL	3 S	1740	1741	3	1			
	606	MANI	04 S/F	2210	2233.4	75.1	395	108		
	606	MANI	29 PBI	2333.1	2333.1	67.1	23.9	10.4		
	4995	BCUL	49 GB	2223.5	2250	126	1933	538		
	500	HIRA	48 C	2224.5		95		40		
	500	HIRA		2224.5	2226.7		190			WL, 1ST PEAK
	500	HIRA		2224.5	2228.7		23			WL, 2ND PEAK

SOLAR RADIO EMISSION
OUTSTANDING OCCURRENCES

SEPTEMBER 1977

SEP 1977	FREQUENCY	STATION	TYPE	STARTING TIME	TIME OF MAXIMUM	DURATION	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1}		INT	POLARIZATION OR REMARKS
				UT	UT	MINUTES	PEAK	MEAN		
	500	HIRA		2224.5	2233.1		550			/, 3RD PEAK
	500	HIRA		2224.5	2325.3		40			WR, 4TH PEAK
	1420	BOUL 47 GB		2224	2314.5	121.5	413	119		
	606	SGMR 47 GB		2225.1	2233	37.9D	1703	511 U		2,5,SWF
	410	SGMR 49 GB		2225.4	2232.8	19	752	226		2,5,SWF
	1415	SGMR 4 S/F		2225.5	2233.2	37.5D	322	96.6U		2,5,SWF
	1415	MANI 47 GB		2225.6	2313.6	67.5	545	180		
	1415	MANI 29 PBI		2333.1	2333.1	67.1	139	44.8		
	2695	MANI 47 GB		2225.6	2259.6	67.5	1350	690		
	2695	MANI 29 PBI		2333.1	2333.1	67.1	315	103		
	4995	MANI 47 GB		2225.6	2246	67.5	3400	1230		1 SWF
	4995	MANI 29 PBI		2333.1	2333.1	67.1	255	81		
	2695	BOUL 49 GB		2225	2300.5	121	1636	246		
	3750	TYKW 47 GB		2225	2258	115	1850	530		06?102F
	3750	TYKW 29 PBI		2420		190	17	5		
	1000	TYKW 45 C		2225	2321	110	260	75		06R/04L
	1000	TYKW 29 PBI		2415		60	3	1.5		
	2000	TYKW 47 GB		2225	2232.1	115	1300	270		06R/01L
	2000	TYKW		2225	2317.3		960			
	2000	TYKW 29 PBI		2420		190	8	2		
	15400	SGMR 47 GB		2227.5	2235.9	14.3	3181	954		2,5,SWF
	208	VORO 49 GB		2228	2232	32	250			
	200	HIRA 48 C		2228.3	2232.7	30	3500	200		WL
	8800	MANI 47 GB		2228.4	2243.1	64.7	2100	740		2 SPA
	8800	MANI 29 PBI		2333.1	2333.1	67.1	390	125.		
	2800	OTTA 28 PRE		2223	2226.5	5	5.8			
	2800	OTTA 47 GB		2228	2259.2	112	1370	363		
	2695	PENT 29 PBI		2420	2420	90 D	16			
	9400	TYKW 47 GB		2228	2241.3	102	4600	930		03L
	9400	TYKW 29 PBI		2410		140	30	9		
	35000	SGMR 47 GB		2229.2	2231.3	5.9	1244	373		2,5,SWF
	245	SGMR 49 GB		2229.8	2231.6	15.2	1618	485		2,5,SWF
	100	HIRA 48 C		2230	2240 U	56	1250 D	400 D		WLWR
	35000	NAGO 47 GB		2231	2240	30	1170			
	35000	NAGO 29 PBI		2301		70	135			
	8800	SGMR 47 GB		2232.6	2246.4	19.3	2079 U	623 U		2,5,SWF
	4995	SGMR 47 GB		2234.9	2246.5	18	772 U	232 U		2,5,SWF
8	700	SYDN 8 S		0513.2	0513.4	.6				
	536	ONDR 8 S		1053.2	1053.2	.3	41			
	536	ONDR 3 S		1133.7	1133.7	.2	11			
	536	ONDR 3 S		1335.5	1335.5	.2	17			
	1420	BOUL 1 S		2200	2201.5	2.5	1			
	2000	TYKW 5 S		2201	2201.5	1	2.5	.8		0R
	1000	TYKW 45 C		2201	2201.5	1	2.8	.6		
	2800	OTTA 1 S		2201	2201.7	1	6	.3		
	2695	BOUL 8 S		2202	2205	1.5	5	2		
	2800	OTTA 20 GRF		2220	2230	40	1	.5		
	1400	SYDN 48 GB		2225	2231	85				
	700	SYDN 48 GB		2225	2231	85				
9	3750	TYKW 5 S		0235	0237	5	2	1		
	5730	IRKU 1 S		0457	0457.8	2	5			L
	5730	IRKU 45 C		0607	0609.8	20	8			L
	5730	IRKU		0607	0623		11			L
	9100	GORK 20 GRF		0846.5	0854	43.5	6.5	3		
	9100	GORK 20 GRF		1022.3	1026.7	8.4	8	4		
	9100	GORK 20 GRF		1036.6	1039	8.4	4	2		
	160	OWIN 45 C		1047	1050	4	35	5		
	240	OWIN 45 C		1047	1050	4	20	1		
	2800	OTTA 20 GRF		1150	1207	42	2.6	1.3		
	2800	OTTA 240 R		1350	1535	105	2.8	1.4		
	4995	ATHN 3 S		1558.1	1558.8	6.5	21.1	6.3		
	4995	BOUL 49 GB		1600.5	1643	171	2331	475		
	9100	ARCE 28		1603.4		21.9				
	1420	BOUL 47 GB		1617.5	1719	168	341	61		
	2695	BOUL 47 GB		1622.5	1646.5	161.5	1098	191		
	9100	ARCE 42		1625.3		34.8				AT SUNSET
	2800	OTTA 28 PRE		1610	1615	15.5	3.4			
	2800	OTTA 47 GB		1625.5	1645	154.5	1100	333		
	2800	OTTA 29 PBI		1900	1900	165	8.6	3		
	1420	ARCE 46		1625.8	1630.8	9.8				AT SUNSET
	4995	ATHN 15 GB		1627.7	1631	12.1	820	246		
	4995	ATHN 15 GB		1627.7	1633.3		1380	414		
	4995	ATHN 15 GB		1627.7	1636.1		2560	768		
	930	BORC 46 C		1627	1631	33	224	40		
	930	BORD 30 PBI		1700	1727.4	60 D	185			
	237	TRST 47 GB		1629.5	1633.5	33.5	110	40 R		VAR.POL.
	15400	SGMR 47 GB		1631.5	1633.6	84.5	6023	2409		SWF
	15400	SGMR 47 GB		1631.5	1717.3		408			2,4,CONT,
	35000	SGMR 47 GB		1631.5	1633.6	84.5	3627	1451		2,4,CONT,
	245	SGMR 7 C		1632.8	1634.1	73.6	98.7	39.5		SWF
	245	SGMR 7 C		1632.8	1718.5		63.8			2,4,CONT,
	410	SGMR 7 C		1632.8	1633	78.2	71.4	28.6		SWF
	410	SGMR 7 C		1632.8	1716.8		115.5			2,4,CONT,

SOLAR RADIO EMISSION
OUTSTANDING OCCURRENCES

SEPTEMBER 1977

SEP 1977	FREQUENCY	STATION	TYPE	STARTING TIME UT	TIME OF MAXIMUM UT	DURATION MINUTES	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1} PEAK	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1} MEAN	INT	POLARIZATION OR REMARKS
	4995	SGMR	47 GB	1633	1642.7	129.2	3052	1220		SWF
	4995	SGMR	47 GB	1633	1717.3		1189			2,4,CONT,
	8800	SGMR	47 GB	1633	1717.3		952			2,4,CONT,
	8800	SGMR	47 GB	1633	1640.6	129.2	4580	1832		SWF
	2695	SGMR	47 GB	1633	1718		1066			2,4,CONT,
	2695	SGMR	47 GB	1633	1645.2	129.2	1121	448		SWF
	606	SGMR	22 GRF	1633.4	1735	148.6	91.4	36.6		2,4,CONT,
	1415	SGMR	22 GRF	1633.4	1727.2	148.6	375	150		SWF
	1420	ARCE	29	1635.6						
	18	HOHA	42 SER	1640	1702	38			2	
	9100	ARCE	29	1701.1						
	245	SGMR	43 NS	1746.4	2028.5	313.60	18			
10	3750	TYKW	20 GRF	0010	0040	60	3	1		
	3750	TYKW	20 GRF	0350	0511	190	7	3		
	9100	GORK	20 GRF	0428 E	0530	124.7	17	10		
	2000	TYKW	20 GRF	0500	0515	90	2	1		OR
	9100	GORK	1 S	0705.4	0706.3	1.5	7	3.5		
	3100	CRIM	20 GRF	0713	0736	80	3	1		
	9100	GORK	20 GRF	0719	0748	57.7	7.5	3		
	9100	ARCE	1	0815.1	0815.4	.8				
	1428	ARCE	1	0815.4	0815.5	.5				
	9100	GORK	20 GRF	0845	0900.5	24.5	8.9	4		
	9100	ARCE	21	0847.5	1038.5	420				
	9100	GORK	1 S	0939.8	0940.2	1.8	4	2		
	9100	GORK	20 GRF	1005.4	1038	38.6	9.7	4.5		
	9100	ARCE	1	1122.1	1122.5	2				
	9100	ARCE	3	1415.3	1416.2	4				
	9500	BERL	2 SF	1415	1416	4	13			
	536	ONDR	2 S/F	1440.5	1441.2	1	17	4.2		
	160	DWIN	45 C	1659.8	1700	.6	10	2		
	2800	OTTA	240 R	2125	2225	60	2.6	1.3		
	9400	TYKW	5 S	2317	2317.5	3	6	2		
	3750	TYKW	5 S	2317	2317.5	4	2	1		
11	260	ONDR	44 NS	0710 E		470 D	31			
	9100	ARCE	1	0731.4	0732.4	2.8				
	3100	CRIM	24 R	0955	1052		4			
	160	DWIN	45 C	1006.5		.2	65	5		
	113	POTS	1	1043.7	1046.2	3.3	700	7		
	160	DWIN	45 C	1044		.6	250	5		
	282	IZMI	41 F	1045	1046.5	3	113			
	9100	ARCE	20	1138.9	1156.6	67.5				
	160	DWIN	45 C	1348		1	200	5		
	2800	OTTA	20 GRF	1711	1714.5	60	2.6	1		
	160	DWIN	45 C	1725.6		.2	20	2		
	15400	SGMR	3 S	1849.7	1851.3	3.6	12.1	3.6		SWF
	8800	SGMR	3 S	1850	1851.3	2	23	6.9		SWF
	4995	SGMR	3 S	1850.4	1851.4	4.2	14.9	4.5		SWF
	4995	BGUL	8 S	1850.5	1851	1	9	3		
	2800	OTTA	20 GRF	2125	2140	55	1	.5		
12	260	ONDR	44 NS	0646 E		502 D	44			
	113	POTS	1	0953.5	0955.2	7	250	13		
	237	TRST	41 F	0955.1	0955.4	.5	870	68 L		
	234	POTS	45 C	0955	0955.2	.5	130	30		
	2800	OTTA	20 GRF	1310	1355	105	2	1		
	2800	OTTA	20 GRF	1500	1515	50	1.4	.7		
	2800	OTTA	240 R	1605	1640	35	1.8	.9		
	2800	OTTA	20 GRF	1915	1922	75	1.4	.7		
	208	VORO	43 NS	2215	2220	90	18	8		
13	288	VORO	S/F	0126	0127	2	120			
	200	HIRA	45 C	0126	0127	2	500	40		WR
	100	HIRA	45 C	0126	0127	2	1200	600		O
	3750	TYKW	5 S	0126	0127.5	14	3	1		066047F
	1000	TYKW	5 S	0126	0126.8	3	1	.3		OR
	2000	TYKW	5 S	0126	0126.8	3	2.7	.6		20R
	5730	IRKU	20 GRF	0527	0532	24	18	4		L
	8800	MANI	1 S	0531	0531.9	3.3	8.3	2.1		
	4995	MANI	3 S	0531	0531.9	3.5	10.1	3.4		
	9100	GORK	2 S/F	0531.2	0532.2	2.5	10.7	5		
	9100	GORK	20 GRF	0535	0539.9	15	9.5	4		
	9100	GORK	2 S/F	0631.2	0632	2.4	6	3		
	160	DWIN	44 NS	0753	0900	110	48	5		
	9100	GORK	20 GRF	0805.3	0807.7	10.7	12	6		
	260	ONDR	4 S/F	1058	1058	1	15			
	2800	OTTA	20 GRF	1230	1258	55	1.6	.8		
	160	DWIN	45 C	1257.6		.4	15	2		
	240	DWIN	45 C	1257.6		.4	3	1		
	160	DWIN	45 C	1415.5	1416	2	35	5		
	240	DWIN	45 C	1415.5	1417	2	5	2		
	2800	OTTA	20 GRF	1920	1940	80	2.4	1.2		
14	9400	TYKW	5 S	0329.5	0330.3	6	10	3		

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SEP 1977	FREQUENCY	STATION	TYPE	STARTING TIME	TIME OF MAXIMUM	DURATION	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1}		INT	POLARIZATION OR REMARKS
				UT	UT	MINUTES	PEAK	MEAN		
	3750	TYKW	5 S	0400	0405	20	3	1		066027F
	3750	TYKW	5 S	0429	0430	4	1.5	.5		
	3750	TYKW	5 S	0438	0440	5	1.5	.5		
	3750	TYKW	5 S	0500	0501.4	4	2	1		
	2800	OTTA	240FR	1150	1245	55	4.6	2.3		
	9100	ARCE	1	1314.6	1314.8	2				
	4995	ATHN	2 S	1336.5	1344.8	13.5	14.5	8.7		
	2800	OTTA	20 GRF	1417	1424	20	1	.5		
	4995	ATHN	2 S	1426.6	1436.2	14.3	14.5	8.7		
	2800	OTTA	27A RF	1446.5		243.5	1.8	1.5		
	2800	OTTA	24 R	1446.5	1448	1.5	1.8			
	2800	OTTA	24P R	1448		172	1.8			
	2800	OTTA	20 GRF	1523	1537	140	4.2	2.1		
	1420	ARCE	3	1526.6	1526.8	.8				
	237	TRST	41 F	1556.2	1556.7	1.8	120	13 R		
	245	SGHR	6 S	1557.3	1557.8	2	21.8	4.5		3
	2800	OTTA	26 FAL	1740	1850	70	-1.8	-.9		
	100	HIRA	45 C	2147	2148.7	4	550	150		ML
	245	SGHR	6 S	2148	2149.2	1.5	18.1	9.1		5
15	3750	TYKW	5 S	0253	0256	12	3	1		
	3750	TYKW	45 C	0325	0334.6	50	14	2		
	9400	TYKW	5 S	0330	0334.5	30	17	3		
	2000	TYKW	5 S	0330	0334.6	40	1.4	.5		10L
	5730	IRKU	45 C	0333.5	0335	9	5			
	5730	IRKU		0333.5	0336.7		20			
	3750	TYKW	5 S	0512	0513	4	3	1		
	3100	CRIM	20 GRF	0624	0801	115	6	2		
	160	DWIN	45 C	1019.4		1.1	80	5		
	240	DWIN	45 C	1019.4		1.1	15	3		
	160	DWIN	45 C	1049.3		.7	40	4		
	240	DWIN	45 C	1049.3		.7	5	2		
	160	DWIN	45 C	1140		.3	45	2		
	240	DWIN	45 C	1140		.3	12	1		
	2800	OTTA	20 GRF	1215	1225	60	4.6	2.3		
	2800	OTTA	20 GRF	1440	1455	40	2	1		
	2800	OTTA	20 GRF	1755	1855	95	3.6	1.8		
	2800	OTTA	20 GRF	2015	2030	35	2.2	1.1		
16	240	DWIN	8 S	0833.3			40	1		
	200	GORK	43 NS	0912		78		5		
	240	DWIN	45 C	0913		1	15	2		
	9100	GORK	1 S	0931.5	0932.4	4.8	6.3	3		
	4995	ATHN	2 S	0931.5	0932.4	21.2	6.8	4.1		
	3100	CRIM	7 S	0939	0944	42	10	3		
	240	DWIN	45 C	0957.6		.4	12	2		
	4995	ATHN	2 S	1240	1252.7	29.3	21.1	12.6		
	4995	ATHN	1 F	1336.2	1343	21.5	28.1	14		
	4995	ATHN	1 F	1427.7	1432.9	17	21.1	10.5		
	2800	OTTA	20 GRF	1429	1430.2	25	1.4	.7		
	2800	OTTA	20 GRF	1515	1525	40	2	1		
	2800	OTTA	20 GRF	1610	1620	17	.8	.4		
	2800	OTTA	45 C	1710	1735	50	16.8	12.2		
	2800	OTTA	29 PBI	1800	1800	170	7.8	3		
	2695	BOUL	45 C	1720	1757.5	61	25	19		
	1420	BOUL	23 GRF	1720	1722.5	16.5	2	1		
	4995	BOUL	23 GRF	1728	1735	26	14	5		
	2695	BOUL	45 C	2023	2023.5	3.5	3	1		
	2695	BOUL	2 SF	2027	2028	1.5	3	1		
	2695	BOUL	49 GB	2126.5	2309.5	192.50	1590	219		
	2695	MANI	47 GB	2219	2308.1	82.1	2400	740		
	4995	MANI	47 GB	2219.2	2308	84.8	1100	280		
	1415	MANI	47 GB	2219.2	2303	81.9	1970	380		
	1415	MANI	47 GB	2219.2	2308.2		2400			
	8800	MANI	47 GB	2219.2	2308	83.7	900	232		1 SPA
	1000	TYKW	28 PRE E	2200	2219	19 D	5 U	4 D		
	1000	TYKW	47 GB	2219	2308.3	161	690	80		COMPLEX POL.
	1000	TYKW	30 PBI	2500		180	8	3		
	2000	TYKW	28 PRE E	2135	2159	44 D	20 U	12 D		
	2000	TYKW	47 GB	2219	2308.2	161	950	180		COMPLEX POL.
	2000	TYKW	30 PBI	2500		210	16	6		
	9400	TYKW	28 PRE E	2130	2133.1	49 D	30 U	20 D		15R
	9400	TYKW	47 GB	2219	2308.1	161	610	130		12R
	9400	TYKW	29 PBI	2500		180	20	8		
	3750	TYKW	28 PRE	2125	2158.8	54	40	23		
	3750	TYKW	47 GB	2219	2308.1	161	1100	160		15L,246035F
	3750	TYKW	30 PBI	2500		210	19	8		
	2800	OTTA	28 PRE	2125	2158.6	55	44	20		
	2695	PENT	47 GB	2220	2308	155	1480	248		
	2695	PENT	29 PBI	2455	2455	20 D	17			
	200	HIRA	48 C	2224		140		200		
	200	HIRA		2224	2244		400			SR, 1ST PEAK
	200	HIRA		2224	0000 U		2500 U			SR, 2ND PEAK
	606	MANI	47 GB	2225	2303.5	65.2	2100	215		
	245	SGHR	7 C	2225.1	2239.3	21.90	178.5	71.4		2

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SEP 1977	FREQUENCY	STATION	TYPE	STARTING TIME UT	TIME OF MAXIMUM UT	DURATION MINUTES	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1} PEAK	FLUX DENSITY MEAN	INT	POLARIZATION OR REMARKS
	245	SGMR	7 C	2225.1	2246.2		177.8			2
	606	SGMR	46 C	2225.8	2233.6	21.20	60.4	24.2		2
	606	SGMR	46 C	2225.8	2238.5		62			2
	1415	SGMR	46 C	2226.2	2229.2	20.80	42.2	16.9		2
	1415	SGMR	46 C	2226.2	2239.2		77.4			2
	410	SGMR	7 C	2226.8	2232.2	20.20	114.5	45.8		2
	410	SGMR	7 C	2226.8	2238		95.2			2
	100	HIRA	48 C	2226	2253	100	1200	350		MR
	500	HIRA	48 C	2226		70		400		
	500	HIRA		2226	2235.4		90			MR, 1ST PEAK
	500	HIRA		2226	2243.6		88			SR, 2ND PEAK
	500	HIRA		2226	2255.8		310			MR, 3RD PEAK
	500	HIRA		2226	2303.6		1500			SR, 4TH PEAK
	500	HIRA		2226	2310.7		1900			MR, 5TH PEAK
	208	VORO	49 GB	2227	2246	138	274			
	208	VORO		2227	0003		364			
	35000	NAGC	20 GRF	2237	2313	90	80			
	8800	MANI	04 S/F	2343.1	0000.9	66.1	77	22.6		
	606	MANI	04 S/F	2344.8	2356.7	56	265	95		
	606	MANI	47 GB	2344.8	2309		2400			
	1415	MANI	46 C	2344.8	2347.2	82.6	81	76		
	1415	MANI	46 C	2344.8	0004.8		225			
	2695	MANI	46 C	2344.8	2347.2	83.2	64	111		
	2695	MANI	46 C	2344.8	0004		325			
	500	HIRA	48 C	2345	2357	75	1270	300		MR
	4995	MANI	46 C	2345.3	2347	64.9	41.6	80		
	4995	MANI	46 C	2345.3	0004		200			
17	3750	TYKW	5 S	0243	0246.4	10	3	1		246035F
	2000	TYKW	5 S	0246	0246.3	2	3	1		15L
	1000	TYKW	5 S	0246	0246.3	1.5	2.4	.5		05L
	1420	ARCE	1	0912.2	0912.4	.6				
	2800	OTTA	240 R	1220	1230	10	2.4	1.2		
	15400	SGMR	3 S	1252.2	1253	1.9	117	35.2		SWF
	9100	ARCE	4	1252.4	1253.1	6				
	4995	ATHN	4 S	1252.5	1252.9	19.7	277.8	78.6		
	4995	SGMR	3 S	1252.5	1253	11.8	263	78.8		SWF
	8800	SGMR	3 S	1252.5	1253	9.6	194	58.2		SWF
	2800	OTTA	3 S	1252.5	1253	2.5	30	11		
	2800	OTTA	29 PBI	1255	1255	55	3.2	1.6		
	2695	SGMR	3 S	1252.5	1253	5.6	24	7.2		SWF
	2800	OTTA	21 GRF	1458	1520	52	2.6	1.3		
	4995	ATHN	1 F	1501.8	1514.5	29.1	23.4	11.7		
	4995	SGMR	3 S	1514.3	1514.7	18.8	24.7	7.4		
	8800	SGMR	3 S	1514.4	1514.7	1.7	24	7.2		
	2800	OTTA	1 S	1514.5	1515	1.5	1.6	.8		
	9100	ARCE	3	1514.5	1514.9	2.2				
	2695	SGMR	1 S	1514.6	1514.8	1.1	2.4	.7		
	2800	OTTA	240AR	1845	1945	60	1.8			
	2800	OTTA	20 GRF	1855	1910	50	3	1.5		
	2800	OTTA	20 GRF	2020	2027	60	1.4	.7		
	2695	BOUL	22 GRF	2025	2033	12	4	1		
	2800	OTTA	240AR	2138	2222	42	1.8			
	2800	OTTA	22 GRF	2143.5	2153	35	4.4	2.4		
	2695	BOUL	45 C	2145	2153	24.5	5	2		
	2695	PENT	23 GRF	2223	2235	37	3	1.5		
	2695	BOUL	20 GRF	2227.5	2236	14	3	1		
	9400	TYKW	5 S	2244	2246	5	10	3		
	2000	TYKW	5 S	2244	2246	15	5	1.5		
	3750	TYKW	5 S	2244	2246	15	7	2		
	2695	PENT	1 S	2245	2246.5	5	3.2	1.2		
	2695	BOUL	3 S	2246	2247.5	11.5	5	2		
	2695	PENT	2 S/F	2305.1	2305.6	2	2.2	1		
	3750	TYKW	45 C	2305	2305.7	3	7	1.5		
	3750	TYKW	29 PBI	2308		20	2	1		
	9400	TYKW	45 C	2305	2305.8	3	9	3		
	2000	TYKW	5 S	2306.5	2307.1	1.5	3	.8		
	1000	TYKW	5 S	2306.5	2307.1	1.5	2	.3		
	2695	PENT	28 PRE	2345	2353	33	2.2			
	2695	PENT	4 S/F	2418	2430	35	300	65		
	2695	PENT	29 PBI	2446	2446	40 D	21			
	3750	TYKW	28 PRE	2346	2353	31	3	2		
	3750	TYKW	45 C	2417	2429.8	83	365	30		10L,245054F
	3750	TYKW	30 PBI	2540		240	8	5		
18	2695	BOUL	47 GB	0011	0031	26.50	296	51		
	2000	TYKW	45 C	0017	0029.9	83	150	20		03L/02R
	2000	TYKW	30 PBI	0140		240	4.5	2.5		
	9400	TYKW	45 C	0020	0029.7	80	230	40		04R
	9400	TYKW	29 PBI	0140		170	18	4		
	2930	VORO	31 ABS	0020	0030	.2	1150			
	1000	TYKW	45 C	0021	0030.4	59	60	9		06R
	1000	TYKW	30 PBI	0120		180	1.5	.6		

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SEP 1977	FREQUENCY	STATION	TYPE	STARTING TIME UT	TIME OF MAXIMUM UT	DURATION MINUTES	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1} PEAK	FLUX DENSITY MEAN	INT	POLARIZATION OR REMARKS
	1415	MANI	46 C	0022.5	0028.3	30	65	22.5		
	1415	MANI	46 C	0022.5	0030.3		89			
	2695	MANI	46 C	0022.5	0028.3	32	99	31.1		
	2695	MANI	46 C	0022.5	0030		149			
	4995	MANI	46 C	0022.5	0028.3	33.5	205	55		
	4995	MANI	46 C	0022.5	0029.9		405			
	8800	MANI	46 C	0022.5	0028.3	33.5	98	61		2 SPA
	8800	MANI	46 C	0022.5	0029.9		235			
	35000	NAGO	20 GRF	0023	0053	110	29			
	500	HIRA	45 C	0026	0029.7	16	15	3		WR
	606	MANI	20 GRF	0027.9	0030.3	24.1	5.8	1.1		
	200	HIRA	45 C	0028	0038	22	35	5		O
	100	HIRA	45 C	0029	0031	3	50	10		O
	500	HIRA	6 S	0204.3	0208.3	13.5	2	1		O
	3750	TYKW	5 S	0204	0208	35	14	5		20L.245054F
	2000	TYKW	5 S	0204	0208.6	35	26	8		18R
	1000	TYKW	5 S	0204	0210.4	20	12	5		05L/07R
	3750	TYKW	5 S	0339	0342	10	3	1		245054F
	3100	CRIM	5 S	0644	0700	20	10	3		
	3100	CRIM	29 PBI	0644	0704	74	7	2		
	3750	TYKW	5 S	0654	0700	20	7	2		
	4995	ATHN	2 S	1134.8	1144	14.2	12	7.2		
	4995	ATHN	2 S	1153.3	1158.5	20	9.6	5.8		
	2800	OTTA	22 GRF	1800	1823	50	2.6	1.3		
	4995	SGMR	3 S	1903.7	1906	5.3	24.2	9.7		
	8800	SGMR	3 S	1904	1905.9	3	23	9.2		
	2800	OTTA	40 F	1904.5	1905	2	2			
	2800	OTTA	21 GRF	1904	1913	26	2.4	1.2		
	2800	OTTA	20 GRF	2122	2140	70	3.4	1.7		
	3750	TYKW	28 PRE	2310	2408	58	5	2.5		
	2000	TYKW	21 GRF	2330	2420	120	3.5	1.3		05R
19	4995	MANI	4 S/F	0006.6	0012	23.3	71	25.8		
	8800	MANI	4 S/F	0007.8	0011.8	22.2	68	20.5		1-SPA
	2695	MANI	4 S/F	0008.6	0012	16.4	16.9	4.6		
	2695	PENT	21 GRF	0008	0020	34	8.2	4.1		
	3750	TYKW	45 C	0008	0011.9	52	48	16		245066F
	3750	TYKW	29 PBI	0100		50	8	4		
	9400	TYKW	5 S	0009	0011.8	8	37	10		05L
	2000	TYKW	5 S	0011.5	0011.9	1.5	5.5	2		15R
	2695	PENT	4 S/F	0011.5	0012	6	16.8	5		
	2695	BCUL	8 S	0012	0012.5	3	16	5		
	200	HIRA	45 C	0329.5	0330	1	700	200		O
	500	HIRA	45 C	0329.7	0330	3.5	350	40		O
	3750	TYKW	45 C	0330	0331.7	4	16	2.5		245066F
	1000	TYKW	45 C	0330	0332.3	6	4	1.5		05L
	2000	TYKW	45 C	0330	0331	6	9	2		30L
	5730	IRKU	45 C	0331.7	0331.8	4	12			
	5730	IRKU		0331.7	0333		12			
	3750	TYKW	21 GRF	0345	0402	60	4	2		245066F
	3750	TYKW	5 S	0416	0420	29	5	2.5		245066F
	200	GORK	43 NS	0606.4		234		5		
	260	ONDR	44 NS	0640 E		509 D	84	5		
	200	GORK	41 F	0643.2	0645.2U	5.7	30			
	200	GORK		0643.2	0648.4U		30			
	237	TRST	5 S	0645.2	0645.3	.2	500	11 L		
	202	IZMI	41 F	0645.2	0648.6	4.2	400			
	536	ONDR	8 S	0645	0645	.3	32			
	100	GORK	41 F	0646.7	0647	3.7	80			
	100	GORK		0646.7	0648.7		80			
	237	TRST	5 S	0646.8	0646.9	.1	710	12 L		
	237	TRST	41 F	0648.4	0648.5	.3	122	6 L		
	200	GORK	41 F	0757.7	0820.2	60.3	30			
	200	GORK		0757.7	0851.3		30			
	200	GORK		0757.7	0857 U		30			
	9100	GORK	23 GRF	0903		330.8				
	3000	BERL	21 GRF	0903	0956.5	311	11			
	2950	GORK	23 GRF	0912 U		240				
	4995	ATHN	2 S	0913	0916.7	7.3	6.8	4.1		
	9500	BERL	21 GRF	0927.5	1320	301	22			
	200	GORK	6 S	0948.7	0951 U	2.8	30			
	240	DWIN	45 C	0950		2.2	190	15		
	160	DWIN	45 C	0950		2.2	300 D			
	228	HARS	46 C	0950	0950.2	1.5	60 U	20		
	237	TRST	41 F	0950.3	0950.5	1.4	325	9 L		
	4995	ATHN	2 S	0952.7	1022.7	31.3	15.9	9.5		
	9100	ARCE	20	0954	0956.8	13				
	1470	BERL	21 GRF	0955.5	1159	228	6.1			
	9100	GORK	1 S	0956	0956.8	2.6	6	1		
	15000	KISV	45 C	1010	1036.5	69	2444			
	3100	CRIM	28 PRE	0904	0915	82	5	2		
	3100	CRIM	47 GB	1026	1032	41	400	133		
	3100	CRIM		1026	1036.5		400	133		
	3100	CRIM		1026	1053		550	183		
	3100	CRIM		1026	1100.5		600	200		

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	3100	GRIM	29 PBI	1026	1107	99	60	20		
	3000	BERL	46 GB	1026.5	1101	80	825			
	9100	GORK	47 GB	1027	1036	39	2239			
	9100	GORK		1027	1037.3		2203			
	9100	ARCE	47	1027.2	1035.9	41.7				
	9100	ARCE		1027.2	1035.9	18.4				
	4995	ATHN	15 GB	1027.4	1036	82.8	1280	384		
	4995	ATHN	15 GB	1027.4	1037.5		1200			
	1470	BERL	46 GB	1027	1037.6	78	1040			
	1420	ARCE		1027		18.2				
	1420	ARCE	47	1027		40.7				
	9500	BERL	46 GB	1027	1035.9	83	2000			
	234	POTS	45 C	1030	1045	110	105	20		
	606	SGMR	4 S/F	1031 E	1101	75.1D	243	72.8		
	1415	SGMR	47 GB	1031 E	1101.1	75.1D	776	233		
	4995	SGMR	47 GB	1031 E	1100.6	75.1D	1253	385		
	410	SGMR	6 S	1031 E	1103	75.1D	99	29.7		
	245	SGMR	6 S	1031 E	1103.1	75.1D	16.8	5		
	8800	SGMR	47 GB	1031 E	1100.9	75.1D	1034	311		
	2695	SGMR	47 GB	1031 E	1100.6	75.1D	1133	400		
	15400	SGMR	4 S/F	1031 E	1100.9	75.1D	447	134		
	202	IZMI	7 C	1033	1040.3	67	120	35		
	240	OWIN	47 GB	1033	1040	100	180	100		
	160	OWIN	47 GB	1033	1037	100	300 D	100		
	237	TRST	47 GB	1034	1040.2	48.5	260	30 L		VAR.POL.
	228	HARS	28 PRE	1032.5	1033.7	2.5	19	8		
	228	HARS	47 GB	1035	1040.7	31	121	70		
	228	HARS		1035	1035.1	.3U	47			
	228	HARS		1042.8	1043.3	1.2	65			
	228	HARS		1044	1044.3	.5	56			
	228	HARS		1045	1045.5	1.3	121			
	228	HARS		1046.5	1047.5	2.8	87			
	228	HARS		1049.3	1052.5	5.7	109			
	228	HARS	29 PBI	1055	1056.3	5	72			
	127	TORN	47 GB	1035.3	1035.5	4	170	200		
	127	TORN		1035.3	1038.4		750			
	113	POTS	45 C	1035	1039	117	140	35		
	127	TORN	27 RF	1039 U	1055 U	150 U	95	30		
	1420	ARCE		1045.2	1053.8	13.1				
	9100	ARCE		1045.6	1052.9	12.9				
	100	GORK	24 R	1053 E	1102.5	78	100			
	200	GORK	47 GB	1053.5E	1056	87.5	200			
	950	GORK	45 C	1054 E	1100.7U	13.7	108			
	950	GORK	29 PBI	1107	1107.5	14	13.7			
	650	GORK	45 C	1054 E	1101.1	13.6	114			
	650	GORK		1054 E	1106.5		58			
	650	GORK	29 PBI	1107.6	1107.6	39.7	45	20		
	2950	GORK	4 S/F	1058.2U	1100.2	11.3	146			
	1420	ARCE		1058.3	1100.9	9.4				
	9100	ARCE		1058.5	1101	10.4				
	228	HARS	40 F	1102.3	1103.5	2.8	18	3		
	536	ONDR	42 SER	1105 E	1107.2	85	20	5.6		
	808	ONDR	41 F	1105 E	1106.3	45	38	10		
	808	ONDR		1105 E	1118.2		18			
	1420	ARCE	30	1107.7		120				
	9100	ARCE	30	1108.9		212				
	9100	ARCE	3	1109.5	1111.4	6.4				
	3100	GRIM	1 S	1125.5	1126.5	2.5	8	3		
	127	TORN	46 C	1130 U	1135.5	35 U	150			
	2800	OTTA	26A FAL	1138	1300	90	-28			
	3100	GRIM	1 S	1138	1140.5	5	8	3		
	4995	ATHN	1 S	1150.6	1159	13.5	27.2	16.3		
	1420	ARCE	40	1151.1	1154	3.4				
	1470	BERL	45 C	1151	1154.3	4	15			
	3100	GRIM	1 S	1154.5	1159	6	5	2		
	3000	BERL	46 C	1155.5	1159	5.5	24			
	950	GORK	5 S	1205.2	1210.6	10.5	24	11.5		
	650	GORK	20 GRF	1205.5	1210.9	8.4	16.6	8		
	606	SGMR	4 S/F	1205.8	1210.6	10	16	4.8		3
	1470	BERL	4	1205	1210.9	15	44			
	3000	BERL	4	1206.2	1210	10	62			
	1420	ARCE	4	1206.3	1210.4	14				
	2695	SGMR	4 S/F	1206.4	1210.5	13	65.7	19.7		3
	1415	SGMR	4 S/F	1206.4	1210.5	10.1	83.1	24.9		3
	4995	SGMR	4 S/F	1206.4	1210.3	8	30.1	9		3
	2950	GORK	45 C	1206.5	1208.6	6.2	74			
	2950	GORK		1206.5	1210.4		95			
	808	ONDR	46 C	1206	1210.8	14	38	19		
	2800	OTTA	4 S/F	1206	1210.3	11	63	25		
	9500	BERL	3 S	1208	1210.6	9	48			
	100	GORK	6 S	1215.2	1215.4	.9	600			
	240	OWIN	45 C	1225.9		1.1	38	5		
	160	OWIN	45 C	1225.9		1.1	300 D			
	200	GORK	6 S	1226	1226.2	1	70			
	8800	SGMR	4 S/F	1239.1	1239.3	3	75.5	22.7		3

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	606	SGMR	4 S/F	1239.3	1241.5	3.8	23.1	6.9		3
	1415	SGMR	4 S/F	1239.5	1240.4	5.1	31.1	9.3		3
	9500	BERL	4	1239.7	1240	4.3	78			
	4995	SGMR	4 S/F	1240	1240.3	4.1	35	10.5		3
	2695	SGMR	4 S/F	1240	1240.4	2.5	20.4	6.1		3
	3100	CRIM	3 S	1240	1240.5	1.5	10	3		
	410	SGMR	49 GB	1240	1240.2	2.9	730	219		3
	245	SGMR	6 S	1240	1240.2	2.5	93.1	27.9		3
	650	GORK	45 C	1240	1240.6	4.7	10.5	3		
	650	GORK		1240	1242.1		5.5			
	240	OWIN	45 C	1240.1	1240.5	2.2	140	5		
	160	OWIN	45 C	1240.1	1240.5	2.2	200	5		
	9100	ARCE	45	1240.2	1240.5	3.7				
	9100	ARCE		1240.2	1240.5	1.6				
	237	TRST	41 F	1240.2	1240.3	.3	400	8 L		
	950	GORK	41 F	1240.2	1240.6	2.7	7.9			
	950	GORK		1240.2	1242.2		10.4			
	9100	GORK	5 S	1240.2	1240.4	1.1	80	40		
	2950	GORK	45 C	1240.3	1240.5	3.1	24			
	2950	GORK		1240.3	1242		17			
	15400	SGMR	4 S/F	1240.3	1240.5	9	21.4	6.4		3
	1420	ARCE	45	1240	1240.3	5				
	1420	ARCE		1240	1240.3	1.6				
	1470	BERL	4	1240	1240.3	10	14			
	1470	BERL			1241.8		14			
	3000	BERL	4	1240	1240.3	5	18			
	2800	OTTA	45 C	1240	1240.2	4	18.8	7.2		
	808	ONDR	45 C	1240	1241.5	12	25	7		
	536	ONDR	45 C	1240	1240	10	87	4		
	3100	CRIM	3 S	1241.5	1242	1	6	2		
	1420	ARCE		1241.6	1241.9	3.4				
	9100	ARCE		1241.8	1242.1	2.1				
	2800	OTTA	22 GRF	1317	1320	23	1.4	.9		
	2800	OTTA	26A FAL	1342	1510	88	-16.8	-8.4		
	160	OWIN	45 C	1355		1.3	190	10		
	2800	OTTA	45 C	1400	1401	8	2.6	1.3		
	8800	SGMR	3 S	1500.9	1501.5	2.4	31	9.3		
	15400	SGMR	1 S	1500.9	1501.4	1.2	9	2.7		
	4995	SGMR	3 S	1501	1501.5	4.1	22.8	6.8		
	2695	SGMR	1 S	1501.1	1501.4	1	9.6	2.9		
	9100	ARCE	3	1501.1	1501.6	2				
	4995	ATHN	2 S	1501.1	1501.5	.9	24.4	14.6		
	2800	OTTA	1 S	1501	1501.3	2	1.2	.3		
	2695	BCUL	8 S	1502	1502.5	1	7	2		
	2800	OTTA	22 GRF	1512	1610	120	4	2		
	2800	OTTA	240 R	1715	1726	11	1.8	.9		
	2800	OTTA	20 GRF	1728	1738	45	1.8	.9		
	2800	OTTA	21 GRF	1927	1943	28	3.4	2		
	245	SGMR	43 NS	1931.1	1942.9	190.9D	41.3			
	208	VORO	44 NS	2200		240		17		
	200	HIRA	44 NS	2355 E		160 D	15	10		SR
	2695	BCUL	3 S	1931.5	1934.5	28	4	1		
	2800	OTTA	1 S	1932	1934.2	8	4.4	2		
	2800	OTTA	20 GRF	2020	2030	50	1.8	.9		
	2800	OTTA	21 GRF	2135	2230	80	2.2	1.1		
	2800	OTTA	1 S	2139	2140.5	7	2	1		
	2695	PENT	20 GRF	2300	2310	30	1.6	.8		
20	3750	TYKW	45 C	0245	0337.7	95	70	35		10R,245077F
	3750	TYKW		0245	0315.7		63			15R
	3750	TYKW	30 PBI	0420		220 D	35	20 D		
	2000	TYKW	45 C	0245	0315.7	85	87	35		COMPLEX POL.
	2000	TYKW		0245	0333.7		77			
	2000	TYKW	30 PBI	0410		230 D	25	15 D		
	1000	TYKW	45 C	0245	0337.1	85	130	35		COMPLEX POL.
	1000	TYKW		0245	0316		85			
	1000	TYKW	30 PBI	0410		230 D	10	6 D		
	500	HIRA	48 C	0246	0338.8	80	1000	100		SL
	200	HIRA	48 C	0247	0338.3	80	500	240		SL
	5730	IRKU	47 GB	0248	0315.9	180	40			L
	5730	IRKU		0248	0337.7		65			L
	5730	IRKU		0248	0453		145			L
	9400	TYKW	45 C	0250	0337.6	110	78	35		03L
	9400	TYKW		0250	0315.6		55			
	9400	TYKW	30 PBI	0440		200 D	30	20 D		
	606	MANI	40 F	0251.2	0338.4	70.8	151	54		
	1415	MANI	22 GRF	0253	0315.8	72	69	35		
	2695	MANI	22 GRF	0253	0315.5	67	64	31.6		
	4995	MANI	22 GRF	0253	0315.5	67	47.3	24.3		
	8800	MANI	22 GRF	0253	0315.5	67	49.8	24.9		
	700	SYDN	40 F	0253.2	0315.8	73.8				
	1400	SYDN	40 F	0255	0315.7	70.3				
	100	HIRA	48 C	0259	0338	72	1200	500		WRML
	650	GORK	21 GRF	0413.8	0500	102.7	28	11		
	200	GORK	44 NS	0415 E		525		5		

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	240	OWIN	44 NS	0640 E		473 D		5		
	160	OWIN	44 NS	0640 E		473 D		5		
	260	ONDR	44 NS	0650 E		500 D	13			
	245	SGMR	44 NS	1032 E	1842.9	728 D	64.5			CONT
	208	VORO	44 NS	2200		240		11		
	35000	NAGO	20 GRF	0420	0525	160	25			
	700	SYDN	22 GRF	0425	0454.2	57.2				
	1400	SYDN	22 GRF	0425.8	0454.3	66.2				
	500	HIRA	48 C	0426	0451.3	66	53	15		WL
	606	MANI	4 S/F	0426.9	0453.3	59.6	101	45.4		
	1415	MANI	4 S/F	0427.5	0453	67.2	335	167		
	2695	MANI	4 S/F	0428	0448.5	66.8	350	186		
	650	GORK	2 SF	0428.9	0431.6	12.9	15.4	7.5		
	650	GORK		0443.2	0454.9	24.7	77	37		
	2000	TYKW	28 PRE	0425	0437.6	16	20	14		45L
	2000	TYKW	45 C	0441	0451.5	79	380	85		10L
	950	GORK	5 S	0442	0454.4	33	172			
	2950	GORK		0442 U		80 U				
	950	GORK	21 GRF	0442		109.2				
	4995	ATHN	2 S	0442.5	0453	41.9	154.7	92.8		
	3750	TYKW	28 PRE	0430	0431.5	12	2	1.5		245077F
	3750	TYKW	5 S	0442	0453	68	230	60		15R,245077F
	1000	TYKW	28 PRE	0410	0426.2	32	28	18		15R/20L
	1000	TYKW	5 S	0442	0454	78	255	55		02R
	4995	MANI	3 S	0443	0452	51.2	150	81		
	9400	TYKW	5 S	0445	0453	45	60	20		08L
	8800	MANI	3 S	0447	0452.9	47.2	95	42.3		
	9100	GORK		0455 E		245				
	3100	CRIM	26 FAL	0707	1015		9			
	536	ONDR	8 S	1041	1041	.3	29			
	4995	ATHN	2 S	1151.7	1201	14.4	28.1	16.8		
	2800	OTTA	22 GRF	1155	1210	50	4	2.2		
	4995	ATHN	2 S	1217.8	1224.1	121.1	33.2	19.9		
	4995	ATHN	2 S	1217.8	1237.1		37.8			
	4995	ATHN	2 S	1217.8	1243.8		43.4			
	4995	ATHN	2 S	1217.8	1256.2		40.8			
	2800	OTTA	240 R	1250	1310	20	2.4	1.2		
	4995	ATHN	2 S	1427.5	1433.4	31.1	12.8	7.7		
	2800	OTTA	20 GRF	1500	1504	40	2.8	1.4		
	2800	OTTA	21 GRF	1540	1610	95	1	.5		
	2800	OTTA	4 S/F	1631.5	1632.1	2.5	14.4	3.6		
	2800	OTTA	29 PBI	1634	1634	15	1.2	.6		
	9100	ARCE	3		1632.2	1633	8			AT SUNSET
	2695	BCUL	8 S	1632	1633	5.5	13	4		
	2800	OTTA	27AFRF	1720		310	2.2	2		
	2800	OTTA	24 R	1720	1740	20	2.2	1.1		
	2800	OTTA	24P R	1740		253	2.2			
	2695	SGMR	4 S/F	1840	1840.6	1.7	19.8	7.9		CONT
	4995	SGMR	4 S/F	1840.3	1841.2	2.2	23	9.2		CONT
	2695	BCUL	8 S	1840.5	1841	2	15	5		
	2800	OTTA	4 S/F	1840	1840.6	2	20	6		
	2800	OTTA	20 GRF	1909	1910.5	11	1.6	.8		
	2800	OTTA	20 GRF	2010	2015	20	1.8	.9		
	2695	BCUL	8 S	2045	2045.5	2	11	4		
	2800	OTTA	20 GRF	2100	2105	20	3.6	2		
	2695	PENT	26 FAL	2153	2240	37	-2.2	-1.1		
	3750	TYKW	5 S	2259	2303.3	10	5	1		
	9400	TYKW	5 S	2303	2303.6	2	8	3		
	2000	TYKW	5 S	2319	2322	15	2	1		0L
	3750	TYKW	5 S	2320	2325	15	2	1		
	2695	PENT	20 GRF	2320	2326	23	2.2	1.1		
21	2695	PENT	1 S	0000	0005	10	2.8	1.4		
	3750	TYKW	21 GRF	0000	0004.5	80	4	1		
	2000	TYKW	21 GRF	0000	0004	80	2.5	1		0R
	1000	TYKW	5 S	0003.9	0004.1	1	3	.7		10R
	2000	TYKW	5 S	0036	0037.3	2	1.2	.3		0R
	3750	TYKW	5 S	0107	0107.5	2	2	.5		
	2000	TYKW	45 C	0324.5	0327.4	5	5	1		0R
	3750	TYKW	5 S	0327	0327.4	2	6	1.5		
	9400	TYKW	5 S	0327	0327.4	1.5	7	2		
	5730	IRKU	1 S	0327	0327.5	1.5	4	2		R
	200	GORK	44 NS	0406 E		90		5		
	4995	ATHN	2 S	0501.2	0508.2	20.5	27	16.2		
	5730	IRKU	1 S	0537	0537.7	1.5	4			
	9400	TYKW	5 S	0537	0537.5	2	6	2		
	3750	TYKW	5 S	0537	0537.5	2	5	1.5		
	5730	IRKU	1 S	0555	0555.2	.7	4			
	260	ONDR	44 NS	0650 E		497 D	70			
	127	TORN	44 NS	0700 E	1031.8	480 D	40			V=1
	200	GORK	44 NS	0815 E		255		5		
	9100	ARCE	1	0737.8	0738.1	2.5				
	9100	GORK	1 S	0737.9	0738	1.1	5.9	2.9		
	9100	GORK	2 S/F	0816.5	0818.2	2.1	7	3.5		
	9100	ARCE	2	0817	0818.4	2				

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	9100	ARCE	1	0838.8	0839.1	.6				
	9100	ARCE	1	1056	1056.6	1				
	950	GORK	4 S/F	1137	1139.9	5.5	10.3			
	2800	OTTA	1 S	1156	1201	10	2	1		
	9100	ARCE	22	1534.1	1536.5	6				
	2800	OTTA	45 C	1534	1539	26	7.6	3.8		
	2800	OTTA	30 PBI	1600	1600	80	3.8	1.9		
	1420	ARCE	40	1535.3	1538.7	16				
	2695	BOUL	45 C	1535.5	1547.5	27	13	4		
	2800	OTTA	20 GRF	1615	1623	30	3.4	1.5		
	2695	BOUL	45 C	1616.5	1623.5	19	4	1		
	2800	OTTA	1 S	1703	1703.8	2	4.2	2		
	2695	BOUL	23 GRF	1704	1704.5	7	4	1		
	2695	PENT	240 R	2130	2200	30	1.8	.9		
	208	VORO	44 NS	2200		240		9		
	2695	PENT	20 GRF	2249	2256	33	2.2	1.6		
	2695	BOUL	1 S	2256	2256.5	2.5	3	1		
22	3750	TYKW	20 GRF	0200	0215	50	2	1		245086F
	2000	TYKW	21 GRF	0200	0219	50	2	1		15R
	2000	TYKW	42 SER	0213.5	0215.5	3	1.5	.4		40R
	3750	TYKW	45 C	0321	0328	12	2	1		245086F
	200	GORK	44 NS	0415 E		165		5		
	260	ONDR	44 NS	0650 E		499 D	40			
	160	OWIN	44 NS	0709 E		620 D		20		
	240	OWIN	44 NS	0709 E		620 D		15		
	127	TORN	43 NS	0740 U	1053.2	440 D	30			V=1
	245	SGHR	43 NS	1305	1606.7	572 D	148.7			CONT
	200	HIRA	44 NS	2025 E	0000	450 D	10	4		HR
	208	VORO	44 NS	2200		240		13		
	200	HIRA	45 C	0630	0631	2.5	300	30		SR
	200	GORK	41 F	0630	0631	24.4	40			
	200	GORK		0630	0639		40			
	200	GORK		0630	0650.6U		40			
	3750	TYKW	45 C	0642	0643.3	40	6	2		
	3100	CRIM	1 S	0643	0645	4	4	1		
	2000	TYKW	5 S	0643	0643.4	2	2	.7		05L
	3100	CRIM	5 S	0729	0731	13	3	1		
	9100	ARCE	20	0938.7	1012	72				
	9100	ARCE	1	1333.4	1333.6	.6				
	808	ONDR	2 S/F	1356.4	1400.4	5	25	10		
	2695	BOUL	45 C	1356	1401	6.5	6	2		
	2695	SGHR	2 S/F	1357	1400	6	6	1.8		CONT
	4995	SGHR	4 S/F	1357	1400.5	8	36.2	10.8		CONT
	4995	ATHN	2 S	1357.2	1400.4	6.3	34.1	20.4		
	3000	BERL	4 SF	1357.5	1359.8	4.5	8.8			
	1470	BERL	4	1357	1359.7	7.5	14			
	930	BORO	46 C	1357	1359.6	5	38	6		
	536	ONDR	2 S/F	1358.6	1400.4	2.5	9	5		
	245	SGHR	6 S	1358.7	1400	5	68.3	13.7		CONT
	237	TRST	41 F	1358.8	1359.8	1.6	140	0		
	606	SGHR	2 S/F	1358.8	1400.3	2.9	7.2	2.1		CONT
	410	SGHR	6 S	1359	1400.3	2	32.8	6.6		CONT
	1415	SGHR	3 S	1359.2	1400	3.8	14.6	4.4		CONT
	8800	SGHR	4 S/F	1359.2	1400.5	3.8	41.5	12.5		CONT
	9100	ARCE	3	1359.3	1400.6	4.7				
	1420	ARCE	4	1359	1359.8	2.5				
	9500	BERL	4 SF	1359	1400	3	30			
	2800	OTTA	24 R	1726	1727	1	1	.5		
	2800	OTTA	27A RF	1726		31	1	.8		
	2800	OTTA	24P R	1727		19	1			
	2800	OTTA	2 S/F	1728	1729.9	3.5	1.6	.8		
	2800	OTTA	2 S/F	1740	1742	6	1.2	.6		
	2800	OTTA	26 FAL	1746	1757	11	-1	-.5		
	2695	BOUL	40 F	1752	1753	8	10	3		
	3750	TYKW	5 S	2358	2400.2	20	7	2		
	1000	TYKW	45 C	2358	2400.6	7	12.5	1.5		SR
23	3750	TYKW	5 S	0356	0356.7	3	1.5	.5		
	200	GORK	44 NS	0400 E		60		5		
	200	GORK	44 NS	0603 E		72		5		
	240	OWIN	44 NS	0635 E		670 D		3		
	260	ONDR	44 NS	0650 E		497 D	22			
	127	TORN	44 NS	0700 E	1110.2	460 D	60			V=1
	245	SGHR	43 NS	1208.5	1752.3	626.5D	36.8			CONT
	176	OWIN	44 NS	1225 E		200 D		5		
	1000	TYKW	5 S	0629.6	0629.8	.5	12	3		0R
	650	GORK	21 GRF	0639.1	0647.1	43.9	7.8	2.7		
	606	MANI	40 F	0639.5	0641.2	17.5	18.6	12		
	1415	MANI	22 GRF	0639.5	0652.7	17.1	6.2	2.1		
	1415	MANI	46 C	0639.5	0702.7		90			
	500	HIRA	45 C	0640.5	0647.3	25	13	5		0
	1000	TYKW	42 SER	0640	0700.1	30	12	1.5		0R
	950	GORK	40 F	0641	0700.8	19.8	13			
	650	GORK	46 C	0641.1	0641.2	2	11	2.8		

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	650	GORK		0641.1	0642.8		11			
	2000	TYKW	42 SER	0645	0700	25	27	2.5		08R
	1470	BERL	4	0650	0702.5	14	115			
	3000	BERL	4	0650	0700	13	104			
	606	MANI	04 S/F	0657.4	0658.5	8.3	30	6		
	1415	MANI	46 C	0657.6	0659.3	5.9	77	24.2		
	2695	MANI	40 F	0658	0658.6	2.2	195	18.9		
	2950	GORK	4 S/F	0659.4	0700.6	2.3	45			
	650	GORK	2 S	0659.6	0700.4	1.5	7.1	3.5		
	200	HIRA	45 C	0736.3	0737	1.7	150	10		O
	930	BORD	42 SER	0945.4	0945.6	2.6	21	3		
	1470	BERL	20 GRF	1025	1137	45	2.1			
	3000	BERL	20 GRF	1030	1138	66	6.2			
	9500	BERL	20 GRF	1030	1132.5	95	9.5			
	2800	OTTA	240 R	2120	2134	14	1.2	.6		
	2695	PENT	20 GRF	2340	2355	65	2.2	1.1		
24	100	HIRA	45 C	0209.5	0209.5	.8	200	60		O
	100	HIRA	45 C	0211.3	0211.8	1	320	80		O
	3750	TYKW	8 S	0214	0214.2	1	50	5		0L
	2000	TYKW	5 S	0214	0214.4	1	17	3		0R
	1000	TYKW	45 C	0214	0214.2	1	65	10		04R
	9400	TYKW	5 S	0214	0214.7	1.5	7	2		0L
	100	HIRA	45 C	0241	0242	1.5	300	100		O
	200	HIRA	45 C	0241.7	0242	1	350	40		O
	100	GORK	45 C	0524.7	0525 U	2.1	60			
	100	GORK		0524.7	0525.6		65			
	200	GORK	6 S	0524.8	0525.1	.6	30			
	200	GORK	41 F	0536.9	0537	1.2	30			
	200	GORK		0536.9	0537.9		10			
	100	GORK	8 S	0537	0537.1	1	50			
	234	POTS	45 C	0550	0554.3	50	350	20		
	100	GORK	46 C	0551.9	0552	7.7	65			
	100	GORK		0551.9	0556.2		260			
	100	GORK		0551.9	0558.7		4150			
	100	HIRA	48 C	0553	0555 U	17	1200 D	300 D		WL
	200	HIRA	48 C	0553	0555	15	5000	200		O
	4995	ATHN	2 S	0553.3	0554.2	2.2	6.9	4.2		
	228	HARS	47 GB	0553.5	0554.5	18.5	620 U	80		
	228	HARS		0555.8	0557.5	1.8	120			
	228	HARS		0559.9	0600	1.1	95			
	200	GORK	46 C	0553.5	0600.2U	11.2	400			
	2950	GORK	23 GRF	0554	0558.9	7.1	15			
	950	GORK	45 C	0554	0555.5	10.2	38			
	950	GORK		0554	0558.4		24			
	950	GORK		0554	0600.2		22			
	950	GORK	29 PBI	0554	0604.3	20	8.1			
	650	GORK	45 C	0554	0555.5	20.1	36	11		
	650	GORK		0554	0558.6		31			
	500	HIRA	45 C	0554		16		15		
	500	HIRA		0554	0555.6		40			O, 1ST PEAK
	500	HIRA		0554	0558.7		37			O, 2ND PEAK
	606	MANI	46 C	0554.2	0555.6	14.6	43.4	21.7		
	606	MANI	46 C	0554.2	0558.8		37.8			
	1415	MANI	4 S/F	0554.2	0555.1	15.8	39.4	20.4		
	2695	MANI	4 S/F	0554.3	0555.1	12.4	25.4	12.7		
	4995	MANI	3 S	0554.3	0555.3	2.5	14.6	3.2		
	9100	GORK	20 GRF	0554.3	0555.3	78	8.2	3.8		
	2950	GORK	3 S	0554.5	0555.7	2.2	9			
	8800	MANI	3 S	0554.8	0555	1.6	11.7	2.3		
	9400	TYKW	5 S	0554	0555	3	6	2		
	2000	TYKW	45 C	0554	0555	15	35	10		04L
	2000	TYKW	29 PBI	0609		30	2.5	1		
	3750	TYKW	45 C	0554	0555	9	13	5		
	3750	TYKW	29 PBI	0603		50	3	1		
	1000	TYKW	45 C	0554	0555.5	25	50	10		04R
	200	GORK	43 NS	0618		222		5		
	260	ONDR	44 NS	0650 E		501 D	20	4		
	245	SGHR	44 NS	1037 E	1344.1	715 D	21.8			3
	100	GORK	46 C	0802.6E	0802.6	2.7	80			
	100	GORK		0802.6E	0803.4		80			
	100	GORK		0802.6E	0803.6		80			
	100	GORK		0802.6E	0805		75			
	200	GORK	47 GB	0926.3	0926.8	29.7	20			
	200	GORK		0926.3	0944.6		20			
	200	GORK		0926.3	0948.8		130			
	202	IZMI	25 R	0926.3	0947.5	34	56	30		
	127	TORN	48 C	0932 U	0945.7	30 U	70			
	113	POTS	45 C	0934	0958	37	60	20		
	100	GORK	46 C	0936.3	0945.2	35.4	90			
	100	GORK		0936.3	0957.7		500			
	100	GORK		0936.3	0959.3		300			
	1420	ARCE	20	0941.8	1007.8	143				
	1420	ARCE		0941.8	1007.8	65				
	1470	BERL	20 GRF	0942	1008	60	24			

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	127	TORN	27 RF	0952 U	1000 U	60 D	75			
	3100	CRIM	3 S	0954	1006	24	18	3		
	1420	ARCE		1046.8	1105.6	78				
	1470	BERL	20 GRF	1047	1106	46	15			
	3100	CRIM	3 S	1059.5	1111	17	10	3		
	9100	ARCE	1	1406.3	1406.7	.9				
	1420	ARCE	1	1406.4	1406.6	.5				
	1420	ARCE	23	1424.3	1429.6	9.2				
	1420	ARCE	4	1426.8	1427.3	1.1				
	1420	ARCE	1	1504.5	1505.1	.8				
25	200	GORK	44 NS	0412 E		402		5		
	260	ONDR	44 NS	0650 E		500 D	15			
	176	OWIN	44 NS	0815 E		555 D		5		
	245	SGMR	44 NS	1038 E	2037	713 D	117.8			
	1415	MANI	4 S/F	0438	0438.9	3.6	32	8.5		
	2695	MANI	3 S	0439.4	0440	1.8	18.3	6.6		
	9400	TYKW	5 S	0439.5	0440	1.5	19	5		15L
	3750	TYKW	5 S	0439.5	0440	3.5	16	5		40R
	3750	TYKW	30 PBI	0443		20	2	1		
	2000	TYKW	5 S	0439.5	0440.1	3.5	10	3.5		20L
	2000	TYKW	30 PBI	0443		20	1.5	.5		
	1000	TYKW	45 C	0439.5	0443.4	4.5	2.7	.5		
	1000	TYKW		0439.5	0439.7		.9			
	4995	MANI	4 S/F	0439.6	0440	1.1	29.8	8.8		
	8800	MANI	4 S/F	0439.6	0440	1.6	27.6	6.9		2-SPA
	5730	IRKU	1 S	0440.1	0440.5	2	5			R
	3750	TYKW	5 S	0443.3	0443.7	1	2	.5		
	2000	TYKW	5 S	0443.4	0443.8	.8	1	.3		30L
	3100	CRIM	42 SER	0848	0850.5	62	10	3		
	3100	CRIM		0848	0858		14	5		
	3100	CRIM		0848	0925.5		17	6		
	2950	GORK	3 S	0849.4	0850.6	3.3	21			
	9100	GORK	20 GRF	0904.5	0919	115.5	10.7	4.5		
	1420	ARCE	1	1146.2	1146.3	.6				
	2800	OTTA	240AR	1200	1210	10	1.8	.9		
	2800	OTTA	1 S	1206	1207	4	2	1		
	2800	OTTA	24 R	1245	1300	15	1.6	.8		
	2800	OTTA	27A RF	1245		215	1.6	1.4		
	2800	OTTA	24P R	1300		165	1.6			
	3000	BERL	1 S	1311.7	1312	.8	5.2			
	1470	BERL	3 S	1311.7	1312	.8	5.7			
	1420	ARCE	3	1311.9	1312.2	.8				
	2800	OTTA	8 S	1312	1312.1	.6	4.8	2.4		
	2695	SGMR	3 S	1333.6	1344.3	27.6	35.3	10.6		SWF
	8800	SGMR	3 S	1334.9	1344.3	26.2	63.2	19		SWF
	4995	SGMR	3 S	1335.4	1344.3	25.7	72.8	21.8		SWF
	9100	ARCE	21	1335.6	1340.5	117				
	15400	SGMR	3 S	1336.5	1344.3	20.9	50.4	15.1		SWF
	4995	BOUL	8 S	1339.5	1344.5	8	31	10		
	9500	BERL	4	1339	1343.8	17	63			
	3000	BERL	4	1339	1344	18	53			
	4995	ATHN	4 S	1340.3	1344.6	7.1	72.2	21.7		
	2800	OTTA	4 S/F	1340	1344.2	8	34	14		
	2800	OTTA	29 PBI	1348	1348	42	5.4			
	1420	BOUL	45 C	1341.5	1344.5	4	5	2		
	1415	SGMR	1 S	1341.7	1345.7	5.5	6.8	2.7		SWF
	1420	ARCE	40	1341.7	1345.5	6.7				
	1470	BERL	4	1341	1345.4	6	6.1			
	9100	ARCE	28	1342.2		1.4				
	606	SGMR	3 S	1343.2	1346.3	3.8	15.5	4.7		SWF
	930	BORO	42 SER	1343.5	1343.8	3.5	13	3		
	9100	ARCE	3	1343.6	1344.6	3.5				
	2695	BOUL	3 S	1344.5	1345.5	3	17	6		
	9100	ARCE	29	1347.1		33.4				
	2800	OTTA	26 FAL	1545	1620	35	-1.6	-.8		
	4995	SGMR	3 S	1654.6	1657.9	5.3	20.6	6.2		SWF
	8800	SGMR	3 S	1654.7	1656.5	4.7	30	9		SWF
	4995	BOUL	45 C	1654	1658	6.5	20	7		
	15400	SGMR	3 S	1655	1656.4	3.6	36.7	11		SWF
	2695	SGMR	1 S	1656.6	1657.9	3.7	1.8	.6		SWF
	2800	OTTA	1 S	1657	1658	2	2.6	1.3		
	2695	BOUL	1 S	1658	1658.5	1.5	1			
	2800	OTTA	1 S	1855	1856	2	.8	.4		
	2800	OTTA	20 GRF	1900	1930	100	1.6	.8		
26	700	SYDN	40 F	0018.9	0018.9	.7				
	3750	TYKW	5 S	0021	0022.3	5	8	2.5		
	9400	TYKW	5 S	0021	0022.7	5	38	15		
	1000	TYKW	5 S	0021	0022	2	1.7	.5		
	2000	TYKW	5 S	0021	0022.3	2	1.5	.7		
	4995	MANI	4 S/F	0022	0023	2.5	13.4	3.8		
	8800	MANI	4 S/F	0022	0023	2.5	26.5	7.2		
	35000	NAGO	5 S	0022	0023	3	30			
	3750	TYKW	20 GRF	0030	0040	50	1	.5		

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	9400	TYKW	20 GRF	0030	0040	50	3	1		
	9400	TYKW	5 S	0135.5	0136.4	2.5	39	15		
	9400	TYKW	30 PBI	0138		120	6	3		
	5730	IRKU	2 S	0135.7	0136.4	8	16	4		
	3750	TYKW	21 GRF	0135	0230	200	3	1		244075F
	1400	SYDN	45 C	0140.2	0140.4	.4				
	2000	TYKW	8 S	0140.4	0140.5	.3	6	2		OR
	2000	TYKW	21 GRF	0140	0240	200	1.5	.7		
	35000	NAGO	20 GRF	0140	0200	60	8			
	1000	TYKW	8 S	0141.4	0141.5	.5	2	.3		OR
	9400	TYKW	5 S	0141	0141.7	1	9	2		
	1400	SYDN	45 C	0142.9	0143.1	.7				
	3750	TYKW	5 S	0143	0143.3	.6	7	1.5		064095F
	2000	TYKW	45 C	0143	0143.3	1	5	1.5		OR
	1000	TYKW	45 C	0143	0143.4	1	36	5		05R
	3750	TYKW	20 GRF	0355	0425	55	2	1		244075F
	2000	TYKW	45 C	0413	0418	35	1.4	.6		15L
	3750	TYKW	20 GRF	0520	0545	90	6	3		
	2000	TYKW	21 GRF	0525	0533.5	80	3	1		10L
	9400	TYKW	20 GRF	0530	0545	80	5	2		
	9100	GORK	20 GRF	0534.3	0546.4	70.4	11.5	5		
	260	ONDR	44 NS	0700 E		485 D	9			
	100	GORK	43 NS	0806.3	0832.7	69	27	5		
	245	SGMR	43 NS	1205.2	2040.6	624.8D	49.6			5
	200	HIRA	44 NS	2035 E	0140	400 D	10	2		SR
	100	GORK	41 F	0756.3	0757.6	9.8	20			
	100	GORK		0756.3	0759.3		15			
	100	GORK		0756.3	0804.7		45			
	127	TORN	27 RF	0808 U	0820	25 U	10	5		
	9100	ARCE	20	0815.9	0839	149				
	1420	ARCE	20	0836.2	0836.8	24				
	1420	ARCE	1	0951.7	0951.9	.6				
	1420	ARCE	2	1249.4	1249.8	.7				
	9100	ARCE	1	1250	1250.3	.5				
	536	ONDR	8 S	1455	1455	.3	35			
	1420	BOUL	3 S	1906.5	1910	13	22	7		
	2695	SGMR	3 S	1908.6U	1910.2U	5.7U	21.4U	6.4U		5
	2800	OTTA	4 S/F	1908	1910	6	19	6.4		
	2800	OTTA	29 PBI	1914	1914	16	2.6	1.4		
	4995	SGMR	3 S	1909 U	1910.2U	4.8U	13.9U	4.2U		5
	1415	SGMR	3 S	1909.6	1910.1	6.6	27.6	8.3		5
	606	SGMR	3 S	1909.6	1909.7	9.2	42.4	12.7		5
	410	SGMR	7 C	1909.9	1910	8.8	488	146		5
	245	SGMR	48 C	1909.9	1910	5.9	1507	452		5
	4995	BOUL	3 S	1909	1910	7	11	4		
	2695	BOUL	3 S	1909	1911	6.5	17	6		
	18	MCMA	4 F	1910	1913	5			1	
	4995	BOUL	45 C	2158.5	2159.5	5.5	192	25		
	2695	BOUL	45 C	2158.5	2204	6.5	189	42		
	1420	BOUL	8 S	2201.5	2202	1	3	1		
27	208	VORO	44 NS	0000	0045	120	30	10		
	2000	TYKW	5 S	0134.3	0134.6	1	1.8	.5		0L
	3750	TYKW	5 S	0134.3	0134.6	1	2	.5		
	200	GORK	44 NS	0406 E		180		5		
	260	ONDR	44 NS	0720 E		465 D	25			
	245	SGMR	43 NS	1132.2	1506.4	655.8D	31.5			5
	9100	GORK	6 S	1051.4	1051.7	.4	24.8	12.4		
	536	ONDR	8 S	1131	1131	.3	42			
	176	DWIN	45 C	1237.2	1237.5	3	10	2		
	1420	ARCE	22	1444	1523.7	67				AT SUNSET
	9100	ARCE	22	1453	1532.2	71				AT SUNSET
	2800	OTTA	20 GRF	1515	1532.1	100	2	.6		
	176	DWIN	45 C	1531.4		.2	260	5		
	176	DWIN	45 C	1538.9		2	220	10		
	18	MCMA	6 S	1541	1542	3			1	
	2800	OTTA	20 GRF	1715		120	1	.7		
28	5730	IRKU	21 GRF	0204.5	0207.7	12	10	4		L
	3750	TYKW	5 S	0206	0207.6	3	4	2		244096F
	3750	TYKW	29 PBI	0209		70	1.5	.7		
	9400	TYKW	5 S	0206	0207.2	3	6	2		
	2000	TYKW	5 S	0206	0207.7	3	2.5	1		15L
	2000	TYKW	29 PBI	0209		20	1	.5		
	200	GORK	44 NS	0415 E		525		5		
	260	ONDR	44 NS	0730 E		455 D	34			
	176	DWIN	44 NS	0815 E		555 D		4		
	240	DWIN	44 NS	0815 E		555 D		4		
	245	SGMR	43 NS	1101.2	1531.6	684.8D	27.1			
	200	GORK	6 S	0518	0519 U	1.7	30			
	100	GORK	41 F	0518.1	0519.1	3.1	80			
	100	GORK		0518.1	0521		70			
	200	HIRA	45 C	0518.3	0519	1.3	300	25		WL
	100	HIRA	45 C	0518.7	0519.3	1	130	40		WL
	200	GORK	41 F	0551	0554.6	120	30			

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29	200	HIRA	45 C	0018.7	0019	2	400	40		SL
	200	GORK	44 NS	0415 E		315		5		
	127	TORN	44 NS	0620 E	0847.4	340 D	16			V=D
	100	GORK	43 NS	0640.4		350		5		
	260	ONDR	44 NS	0710 E		478 D	12			
	176	OWIN	44 NS	0750 E		115 D		10		
	240	OWIN	44 NS	0750 E		100 D		10		
	176	OWIN	43 NS	1300		270		5		
	200	GORK	27 RF	0521	0636.2	236	100	20		
	202	IZMI	27 RF	0600	0636	156	90	35		
	950	GORK	20 GRF	0615	0632.4	63	12.3	3.7		
	200	HIRA	45 C	0615	0636	65	35	15		ML
	9100	GORK	20 GRF	0616.6	0632.2	58.9	14	5		
	500	HIRA	27 RF	0616	0633	110	26	6		SL
	3100	CRIM	1 S	0617	0619	5	9	3		
	100	HIRA	45 C	0621	0651	80 D	160	40		ML
	100	GORK	27 RF	0623.2	0651.6	174	130	35		
	9400	TYKW	5 S	0625	0632	45	15 U	5 U		0R
	3750	TYKW	28 PRE	0616	0618	10	3	2		
	3750	TYKW	45 C	0626	0632	18	30	12		15R
	3750	TYKW	29 PBI	0644		65	5	2		
	1000	TYKW	28 PRE	0615	0618	11	20	3		SR
	1000	TYKW	45 C	0626	0631.1	14	36	10		25R
	1000	TYKW		0626	0632.1		21			
	1000	TYKW	30 PBI	0640		50	2.5	1		
	2000	TYKW	28 PRE	0615	0618	11	5	2.5		10L
	2000	TYKW	45 C	0626	0632.2	17	31	12		10L
	2000	TYKW	29 PBI	0643		55	1	.4		
	3100	CRIM	3 S	0627	0633	17	25	8		
	2950	GORK	4 S/F	0627.7	0632.5	149	52	24		
	1000	TYKW	45 C	0716	0716.9	2	10	2.5		99R
	176	OWIN	45 C	0913.5		1.5	70	5		
	240	OWIN	45 C	0913.5		1.5	25	3		
	808	ONDR	2 S/F	1110	1110.4	.4	25	2		
	237	TRST	41 F	1623	1623.1	.2	290	11 L		
	606	SGMR	1 S	1745.8	1745.9	.2	5	1.5		
	245	SGMR	6 S	1745.9	1746.1	.4	89.3	26.8		
	410	SGMR	6 S	1746.1	1746.2	.2	24.6	7.4		
	245	SGMR	6 S	1751	1751.2	.5	335.2	100.6		
	410	SGMR	6 S	1751.2	1751.3	.3	46.7	14		
	1415	SGMR	2 S/F	1751.2	1751.3	.2	7.8	2.4		
	606	SGMR	2 S/F	1751.3	1751.4	.2	5.5	1.7		
	4995	BOUL	45 C	2022.5	2029	9.5	27	9		
	2695	BOUL	45 C	2028.5	2031.5	5	18	6		
30	3750	TYKW	20 GRF	0310	0315	40	1.7	.5		
	2000	TYKW	20 GRF	0310	0315	40	1.3	.5		0R
	200	GORK	44 NS	0530 E		384		5		
	260	ONDR	44 NS	0717 E		463 D	21			
	176	OWIN	44 NS	0747		456		5		
	200	GORK	44 NS	1215		45		5		
	245	SGMR	43 NS	1217.2	1303.9	605.8D	32.1			
	950	GORK	5 S	0535.7	0536.2	1.7	22	11		
	2950	GORK	2 S/F	0536.3	0537.9	3.3	12			
	3750	TYKW	45 C	0536	0537.8	4	80	16		
	9100	GORK	23 GRF	0537.7	0612.7	91.6	16	4		
	2000	TYKW	45 C	0537	0537.8	3	1.2	.3		
	9400	TYKW	5 S	0538	0538.7	2	3	1		
	650	GORK	4 S/F	0539.6	0540	.7	37	18		
	9400	TYKW	5 S	0610.5	0611.2	8	18	5		
	9100	GORK	2 S/F	0610.6	0611.5	1.7	15	7		
	3750	TYKW	21 GRF	0610 -	0635	60	2.5	1		
	3750	TYKW	5 S	0612	0613	10	1	.3		
	536	ONDR	8 S	1114.5	1114.5	.3	56			
	536	ONDR	8 S	1241.2	1241.2	.3	35			
	536	ONDR	3 S	1302	1302	.2	17			
	536	ONDR	3 S	1430.3	1430.3	.2	15			
	536	ONDR	3 S	1452.3	1452.3	.2	10			
	2800	OTTA	20 GRF	2115	2137	40	1.4	.9		
	2695	PENT	20 GRF	2224	2226.8	18	1.4			

Reports received from the following observatories:

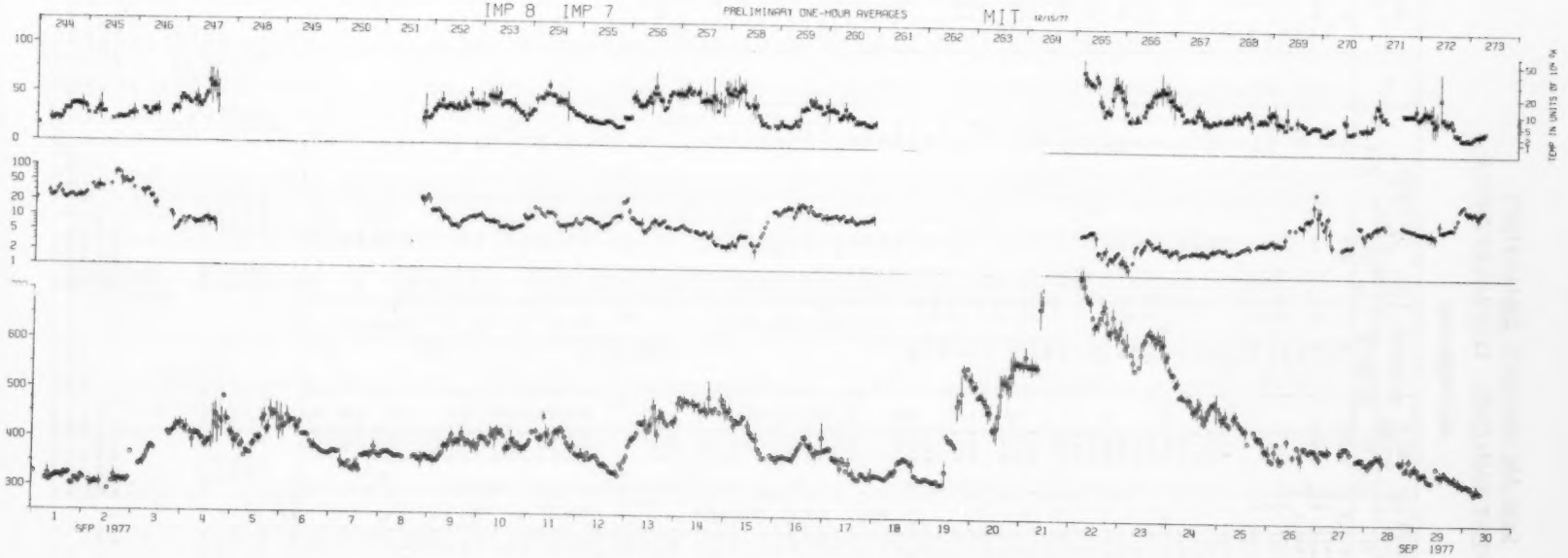
ARCE = Arcetri
BERL = Berlin-Adlershof
BORD = Bordeaux
BOUL = Boulder
CRIM = Simferopol
DWIN = Dwingeloo
GORK = Gorky
HARS = Harestua
HIRA = Hiraiso
HUAN = Huancayo
IRKU = Irkutsk
KIEV = Kiev
MANI = Manila
MCMA = McMath-Hulbert
NAGO = Nagoya
ONDR = Ondrejov
OTTA = Ottawa
PENT = Penticton
POTS = Potsdam
SAOP = Sao Paulo
SGMR = Sagamore Hill
SYDN = Sydney
TORN = Torun
TYKW = Toyokawa
TRST = Trieste
VORO = Voroshilov (Ussurisk)

Explanation of Type Code:

1 Simple 1
2 Simple 1F
3 Simple 2
4 Simple 2F
5 Simple
6 Minor
7 Minor +
8 Spike
20 Simple 3
21 Simple 3A
22 Simple 3F
23 Simple 3AF
24 Rise
25 Rise A
26 Fall
27 Rise and Fall
28 Precursor
29 Post Burst Increase
30 Post Burst Increase A
31 Post Burst Decrease
32 Absorption
40 Fluctuation
41 Group of Bursts
42 Series of Bursts
43 Onset of Noise Storm
44 Noise Storm in Progress
45 Complex
46 Complex F
47 Great Burst
48 Major
49 Major +

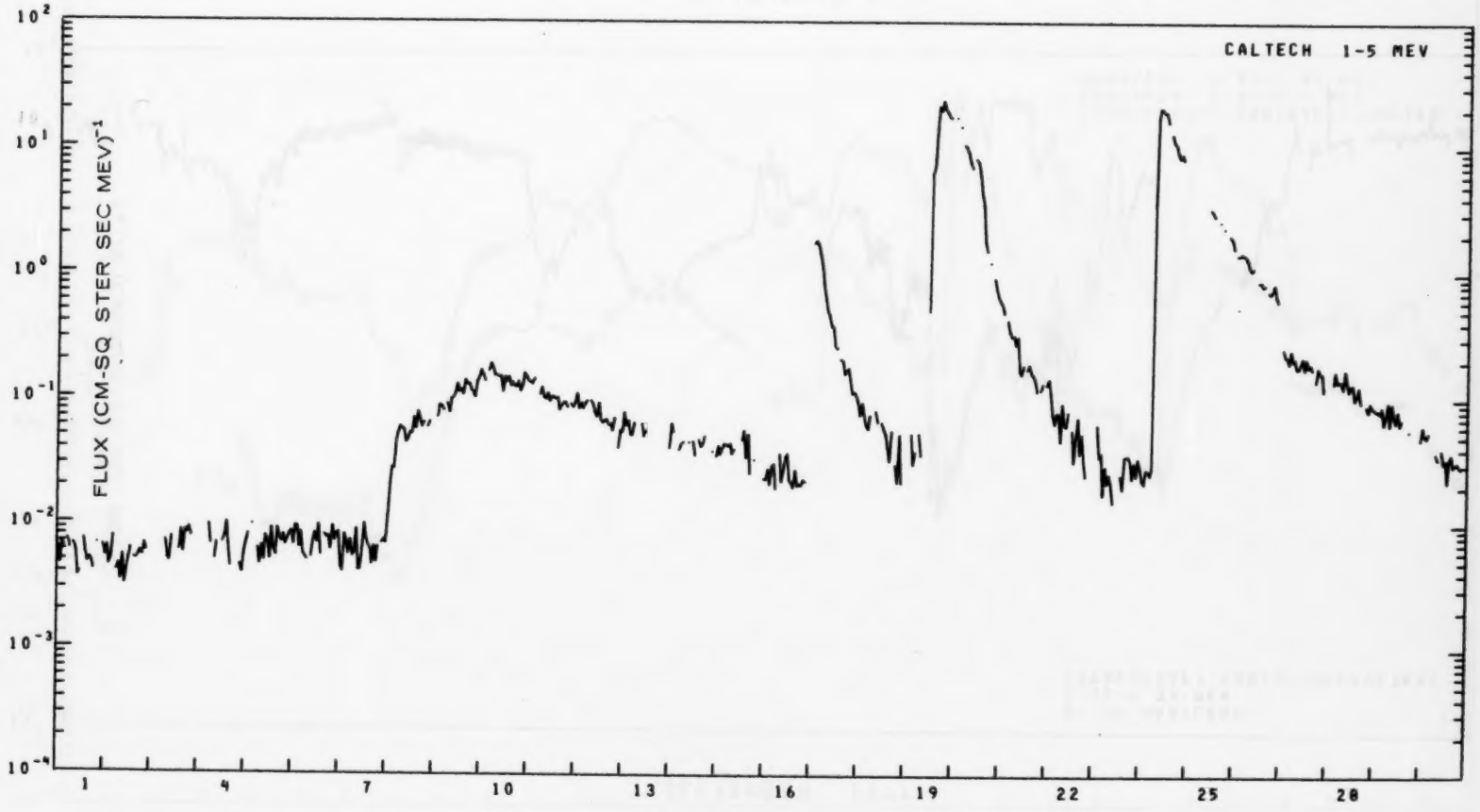
IMP 7 AND 8 SOLAR WIND PLASMA

SEPTEMBER 1977



IMP 7 AND 8 ELECTRONS

SEPTEMBER, 1977



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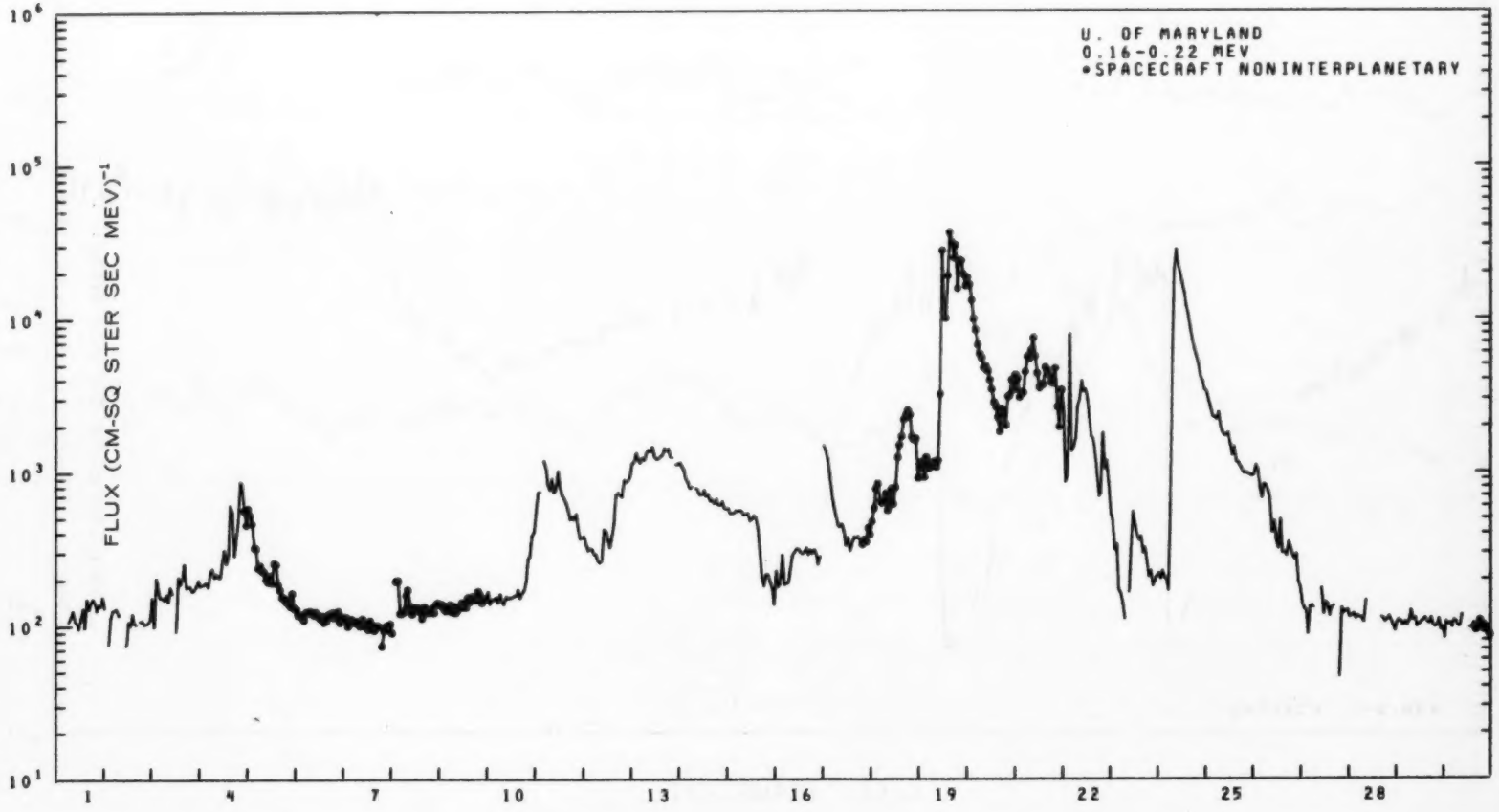
Sep 77

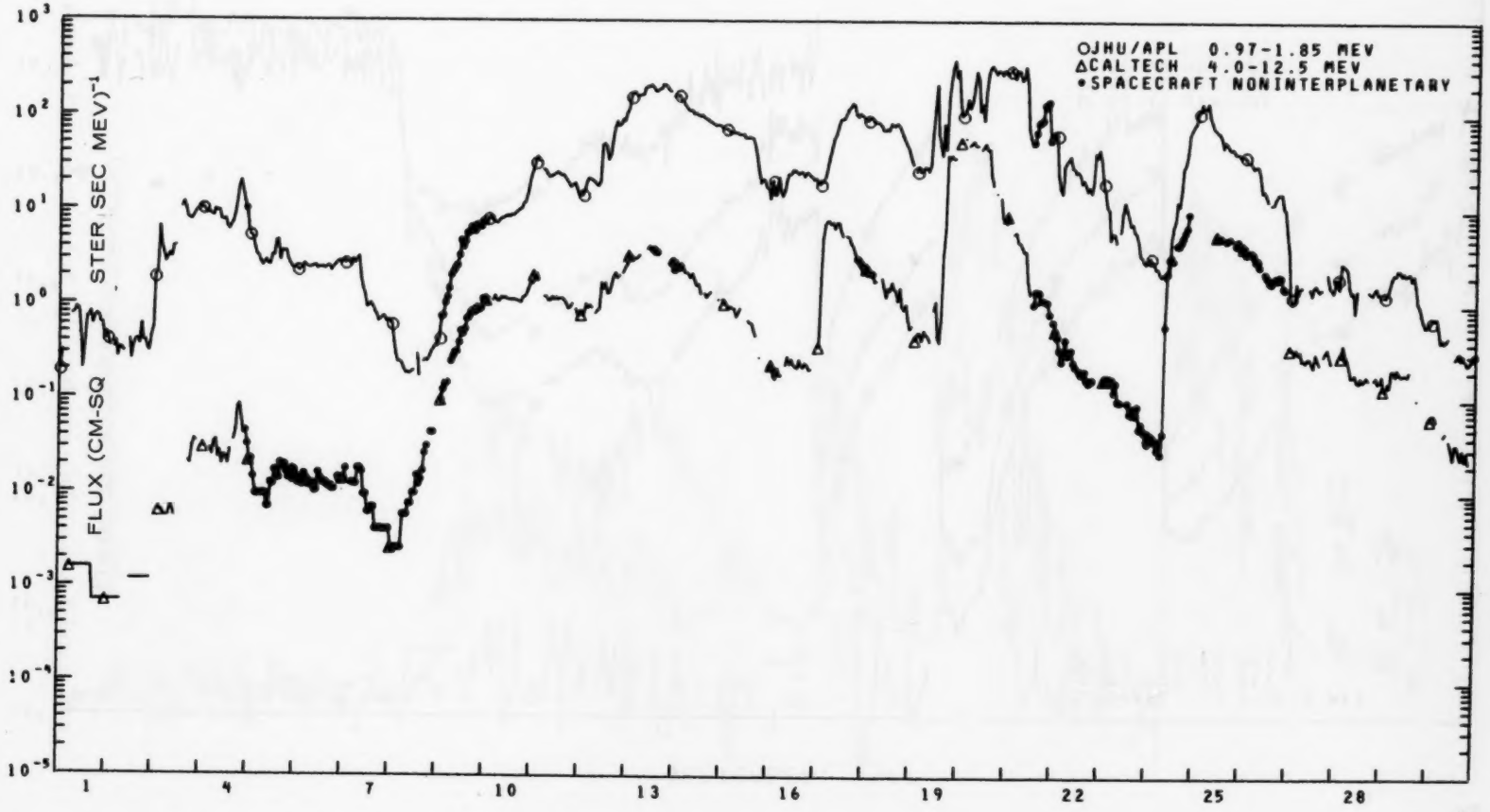
IMP 7 AND 8 LOW ENERGY PROTONS

SEPTEMBER, 1977



IMP 7 AND 8 INTERMEDIATE ENERGY PROTONS

SEPTEMBER, 1977



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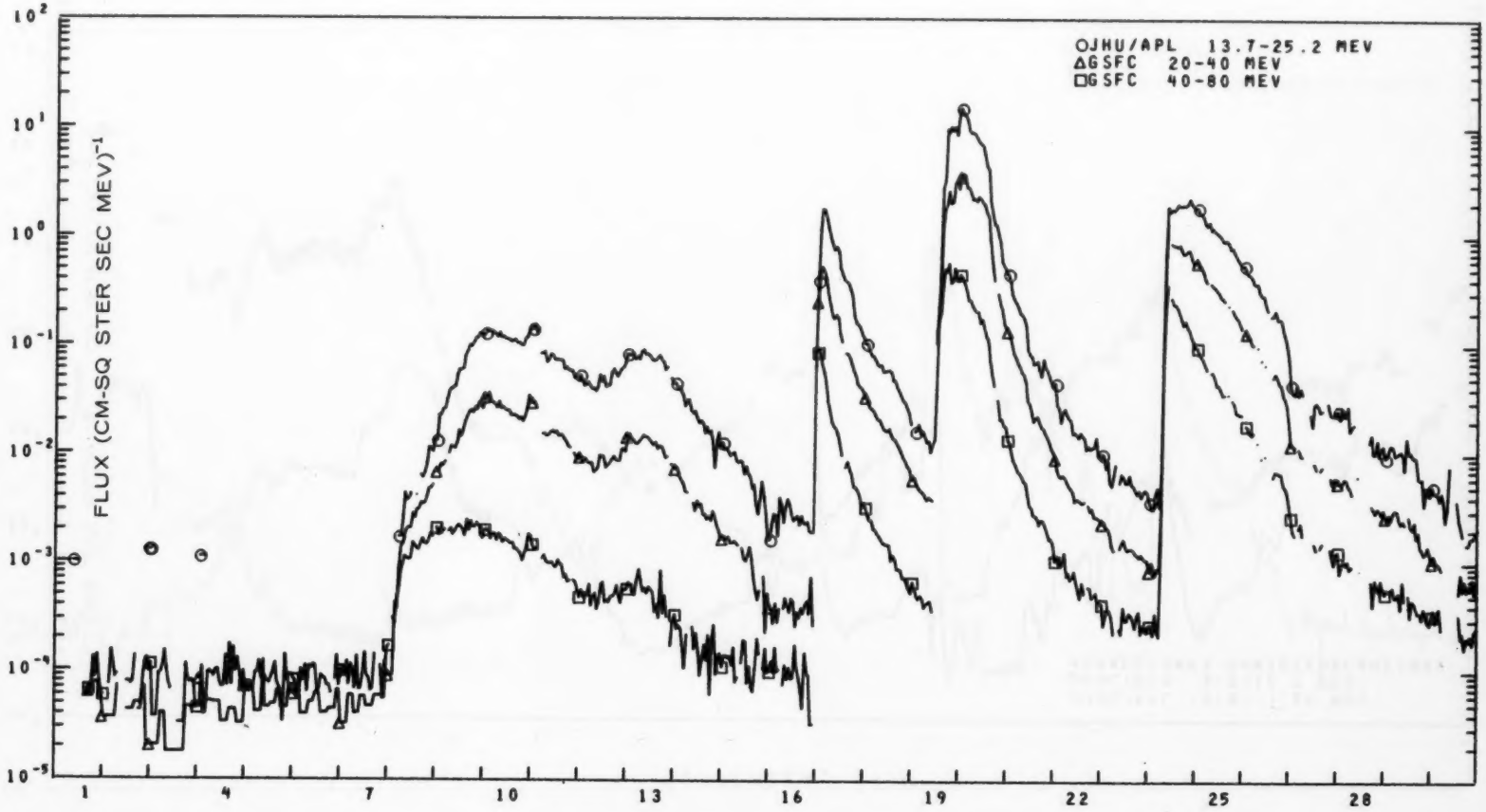
Sep 77

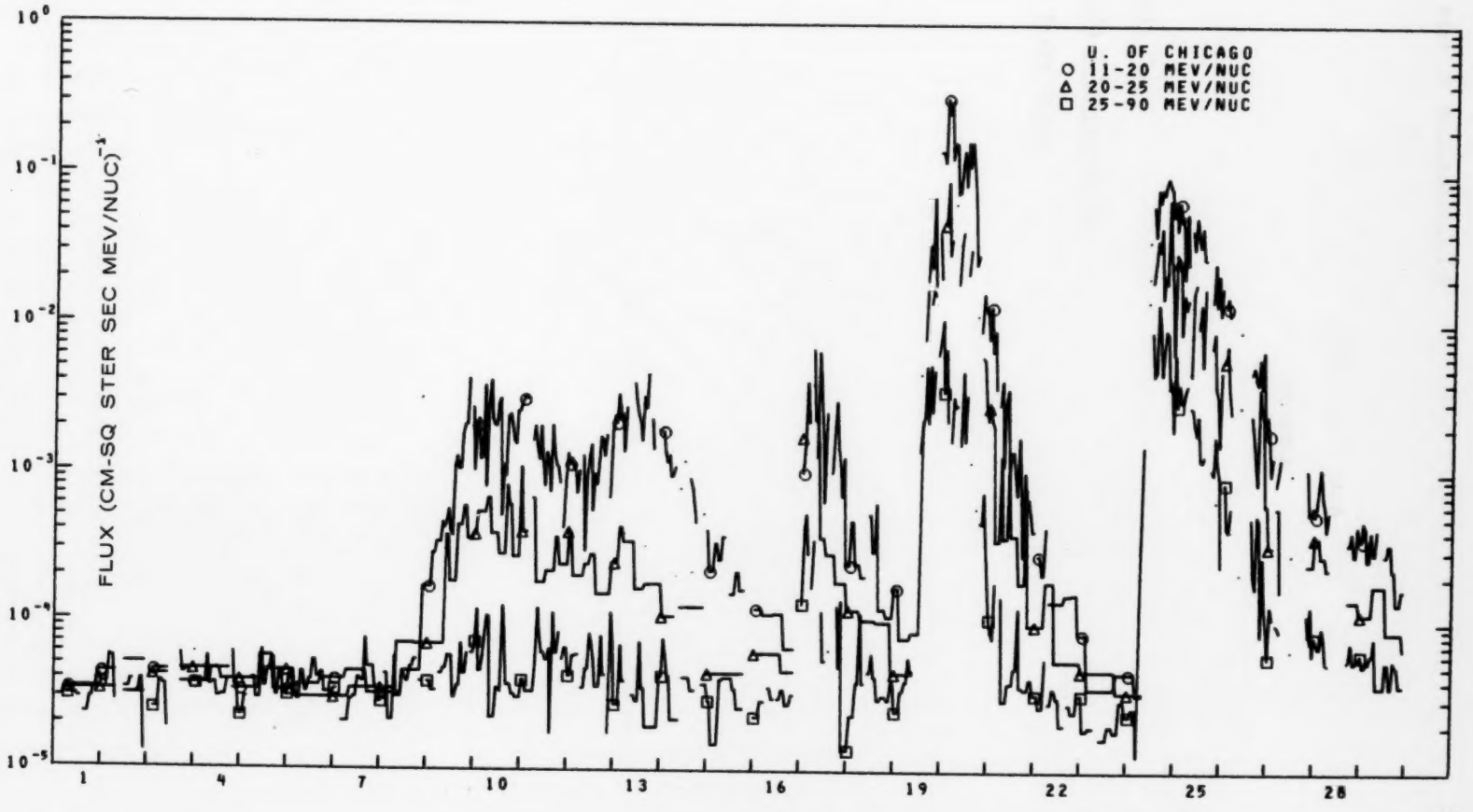
IMP 7 AND 8 HIGH ENERGY PROTONS

SEPTEMBER, 1977



IMP 7 AND 8 ALPHA PARTICLES

SEPTEMBER, 1977



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Sep 77

AUGUST 1977 DATA

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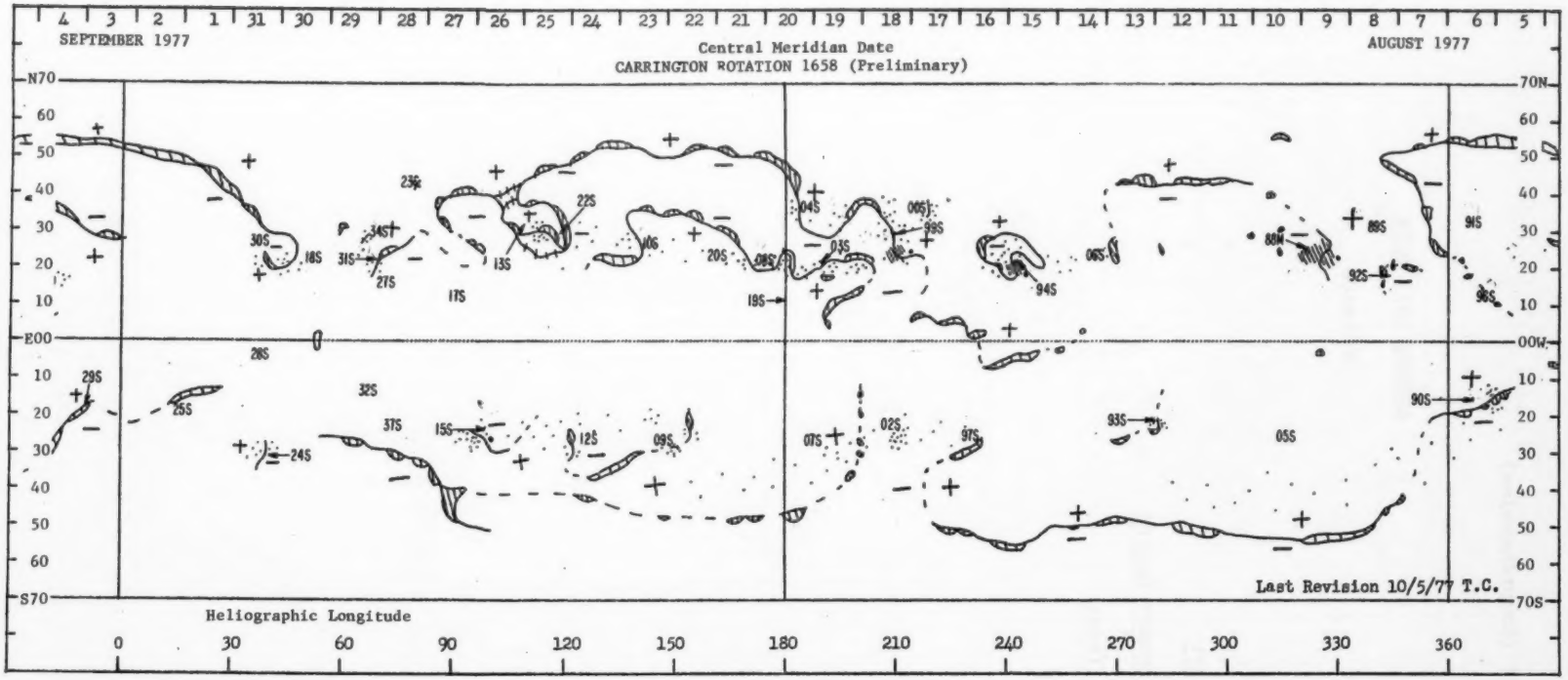
Hα Synoptic Chart	44-45
Abbreviated Calendar Record	46-53
Regional Flare Index	53

ABBREVIATED CALENDAR RECORD

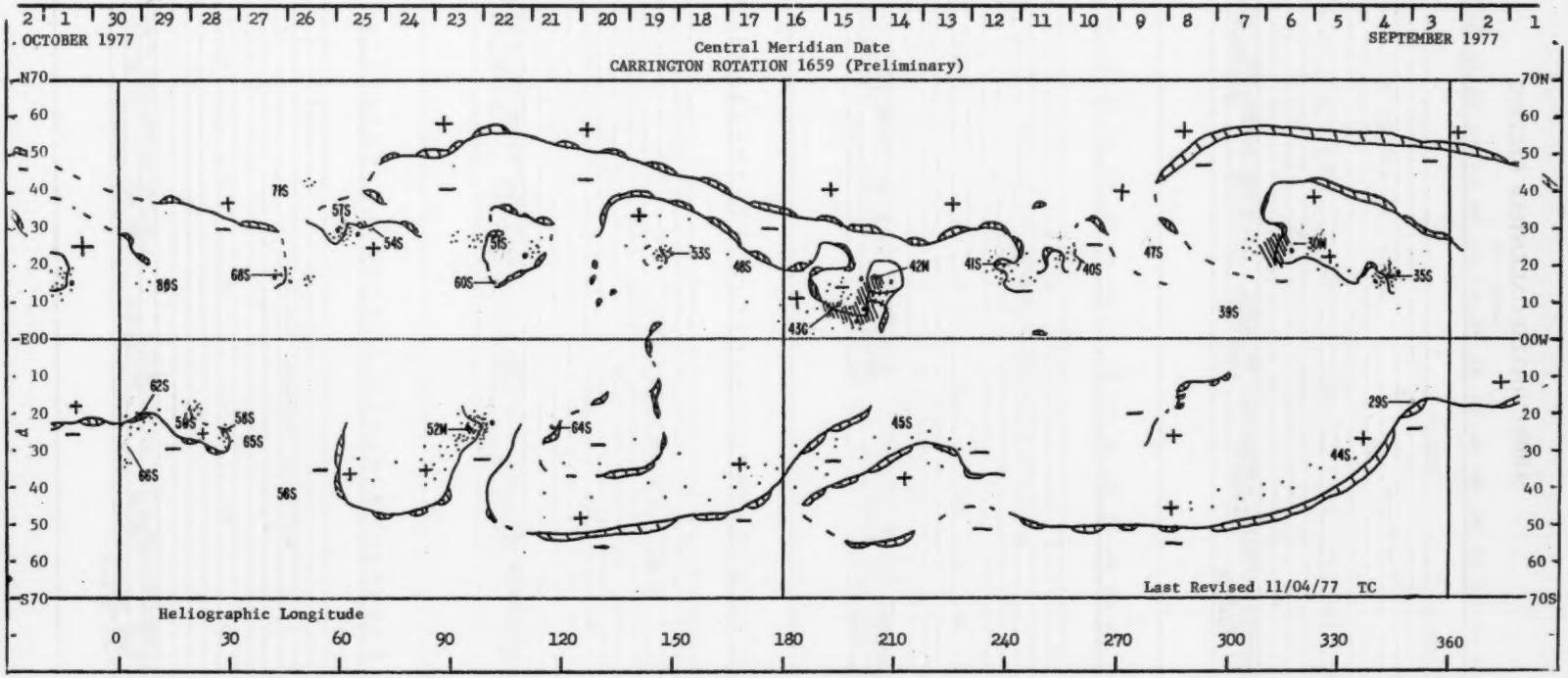
Hα SYNOPTIC CHART

AUGUST 1977 SEPTEMBER 1977



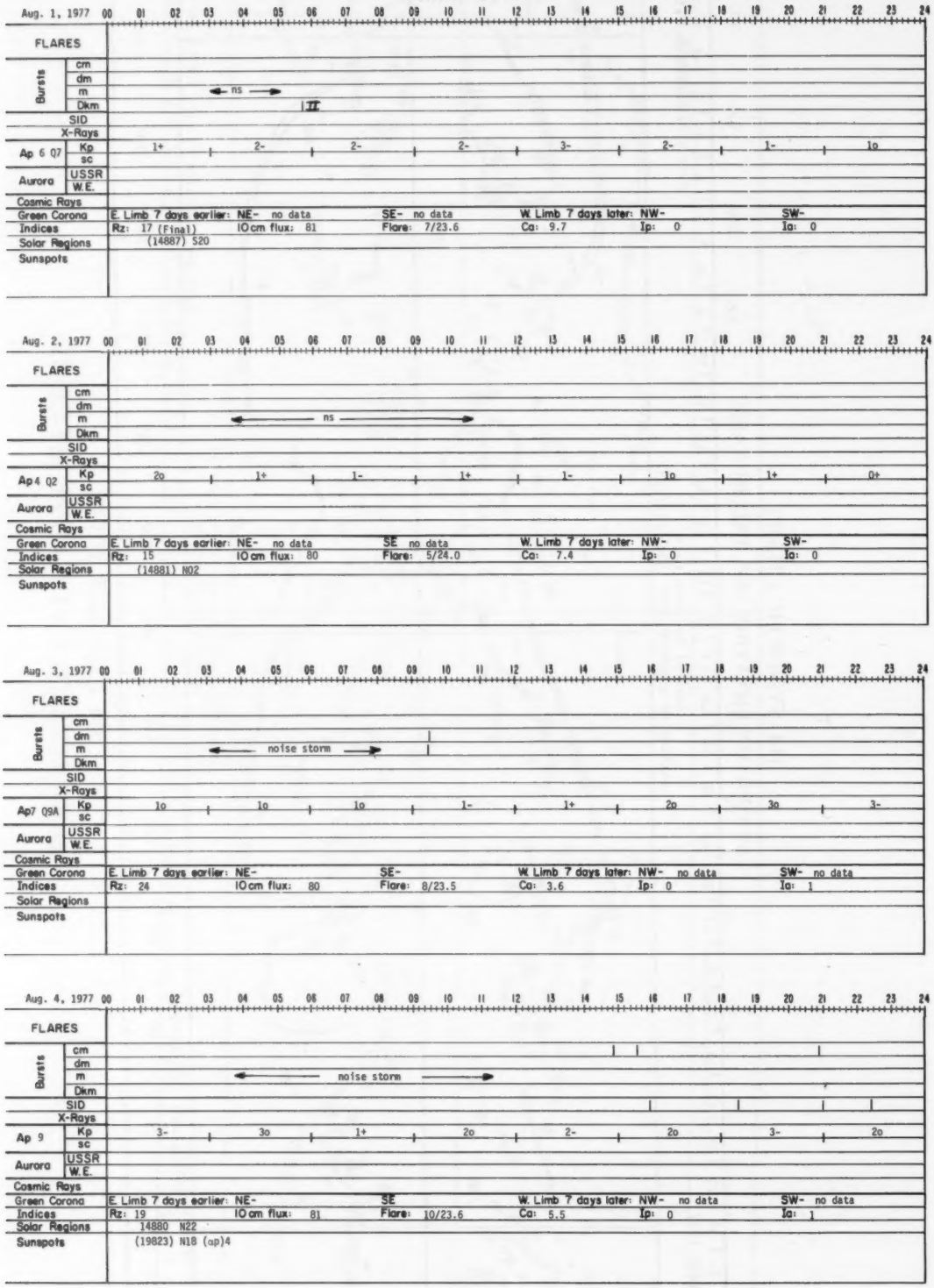
Hα SYNOPTIC CHART

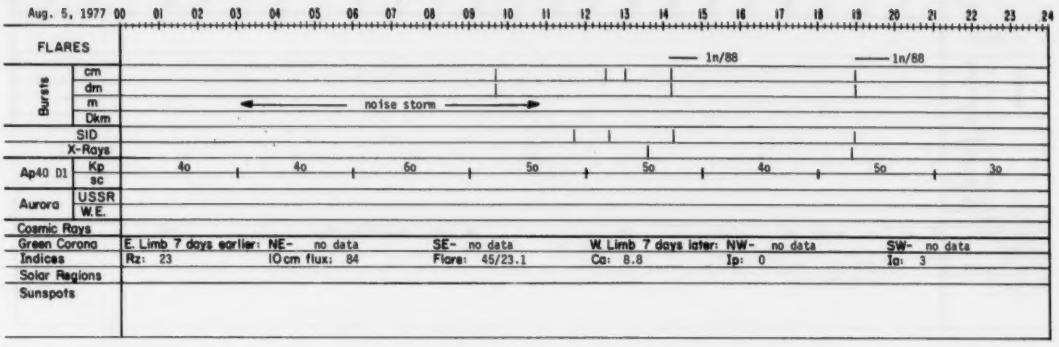
CARRINGTON ROTATION 1659 (PRELIMINARY)

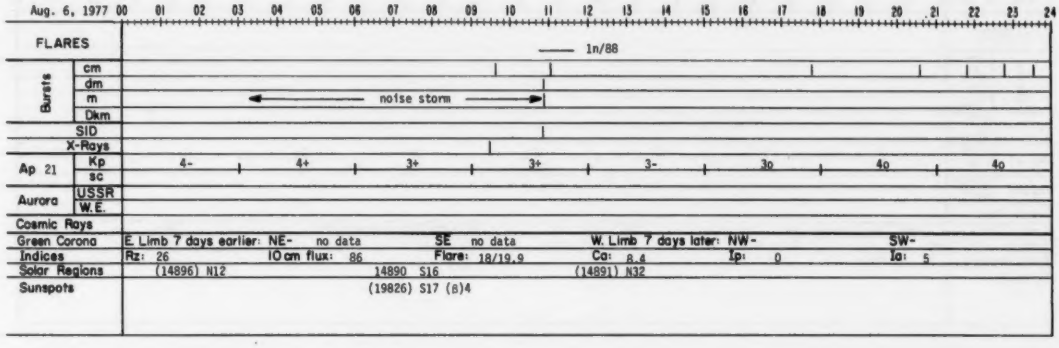


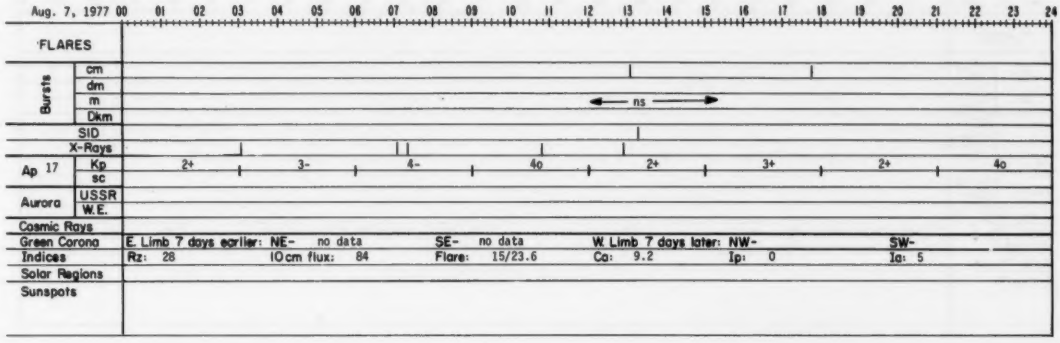
ABBREVIATED CALENDAR RECORD

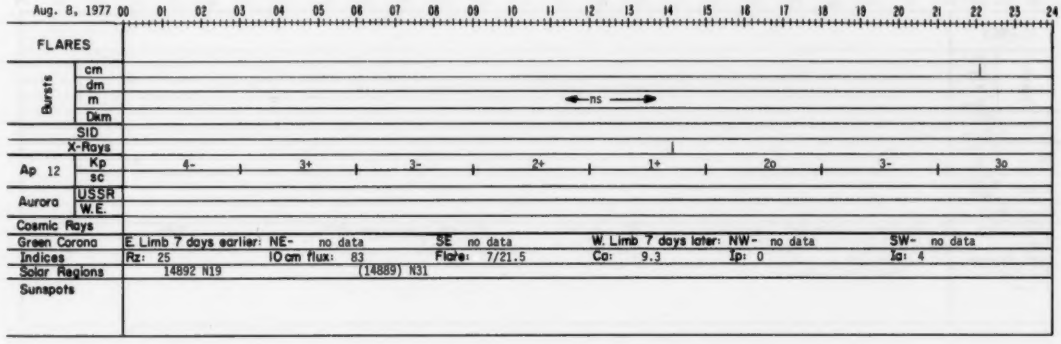
AUGUST 1977

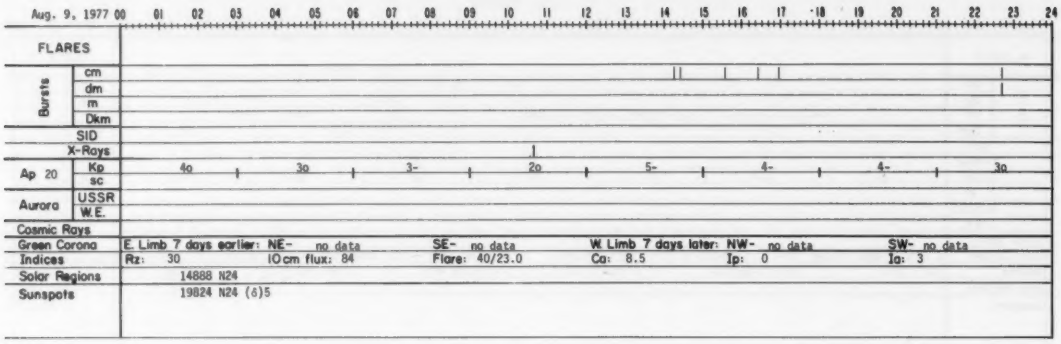


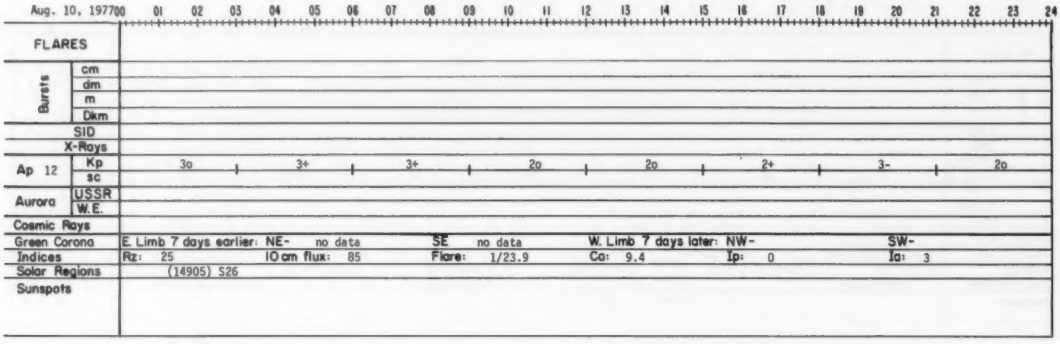

Aug. 5, 1977
FLARES
1n/88
1n/88
Bursts
cm
dm
m
noise storm
Dkm
SID
X-Rays
Ap40 01
Kp
4o 4o 6o 5o 5o 4o 5o 3o
sc
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- no data SE- no data W. Limb 7 days later: NW- no data SW- no data
Indices
Rz: 23 10cm flux: 84 Flare: 45/23.1 Ca: 8.8 Ip: 0 Ia: 3
Solar Regions
Sunspots

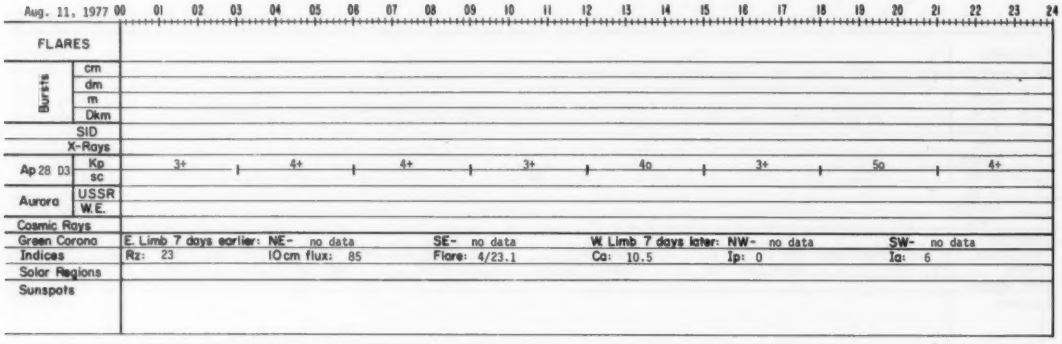

Aug. 6, 1977
FLARES
1n/88
Bursts
cm
dm
m
noise storm
Dkm
SID
X-Rays
Ap 21
Kp
4- 4+ 3+ 3+ 3- 3o 4o 4o
sc
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- no data SE no data W. Limb 7 days later: NW- SW-
Indices
Rz: 26 10cm flux: 86 Flare: 18/19.9 Ca: 8.6 Ip: 0 Ia: 5
Solar Regions
(14896) N12 14890 S16 (14891) N32
Sunspots
(19826) S17 (8)4

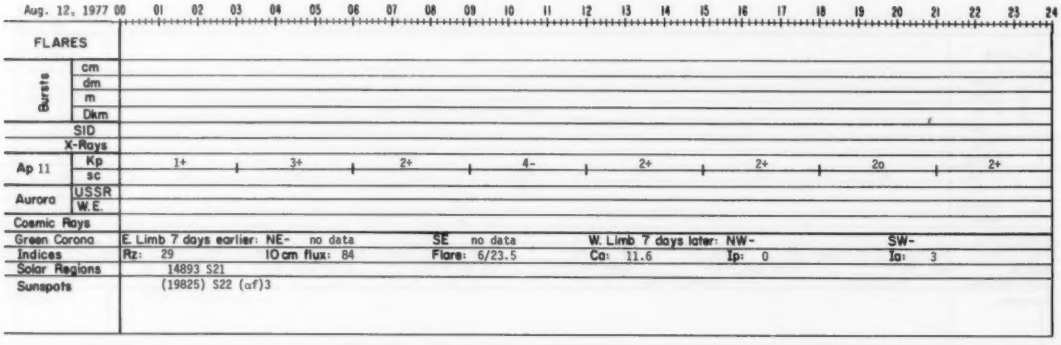

Aug. 7, 1977
FLARES
Bursts
cm
dm
m
ns
Dkm
SID
X-Rays
Ap 17
Kp
2+ 3- 4- 4o 2+ 3+ 2+ 4o
sc
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- no data SE- no data W. Limb 7 days later: NW- SW-
Indices
Rz: 28 10cm flux: 84 Flare: 15/23.6 Ca: 9.2 Ip: 0 Ia: 5
Solar Regions
Sunspots


Aug. 8, 1977
FLARES
Bursts
cm
dm
m
ns
Dkm
SID
X-Rays
Ap 12
Kp
4- 3+ 3- 2+ 1+ 2o 3- 3o
sc
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- no data SE no data W. Limb 7 days later: NW- no data SW- no data
Indices
Rz: 25 10cm flux: 83 Flare: 7/21.5 Ca: 9.3 Ip: 0 Ia: 4
Solar Regions
14892 N19 (14889) N31
Sunspots


Aug. 9, 1977 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts cm dm m Dkm
SID
X-Rays
Ap 20 Kp 4o 3o 3- 2o 5- 4- 4- 3o
sc
Aurora USSR W.E.
Cosmic Rays
Green Corona E. Limb 7 days earlier: NE- no data SE- no data W. Limb 7 days later: NW- no data SW- no data
Indices Rz: 30 10cm flux: 84 Flare: 40/23.0 Ca: 8.5 Ip: 0 Ia: 3
Solar Regions 14888 N24
Sunspots 19824 N24 (6)5


Aug. 10, 1977 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts cm dm m Dkm
SID
X-Rays
Ap 12 Kp 3o 3+ 3+ 2o 2o 2+ 3- 2o
sc
Aurora USSR W.E.
Cosmic Rays
Green Corona E. Limb 7 days earlier: NE- no data SE no data W. Limb 7 days later: NW- SW-
Indices Rz: 25 10cm flux: 85 Flare: 1/23.9 Ca: 9.4 Ip: 0 Ia: 3
Solar Regions (14905) S26
Sunspots


Aug. 11, 1977 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts cm dm m Dkm
SID
X-Rays
Ap 28 D3 Kp 3+ 4+ 4+ 3+ 4o 3+ 5o 4+
sc
Aurora USSR W.E.
Cosmic Rays
Green Corona E. Limb 7 days earlier: NE- no data SE- no data W. Limb 7 days later: NW- no data SW- no data
Indices Rz: 23 10cm flux: 85 Flare: 4/23.1 Ca: 10.5 Ip: 0 Ia: 6
Solar Regions
Sunspots


Aug. 12, 1977 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts cm dm m Dkm
SID
X-Rays
Ap 11 Kp 1+ 3+ 2+ 4- 2+ 2+ 2o 2+
sc
Aurora USSR W.E.
Cosmic Rays
Green Corona E. Limb 7 days earlier: NE- no data SE no data W. Limb 7 days later: NW- SW-
Indices Rz: 29 10cm flux: 84 Flare: 6/23.5 Ca: 11.6 Ip: 0 Ia: 3
Solar Regions 14893 S21
Sunspots (19825) S22 (af)3

Aug. 13, 1977 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES

Bursts: cm, dm, m, Dkm

SID

X-Rays

Ap 11 — Kp: 3o 3- 2+ 2o 3- 2o 2- 3+ — sc

Aurora: USSR, W.E.

Cosmic Rays

Green Corona — E. Limb 7 days earlier: NE- no data; SE- no data; W. Limb 7 days later: NW- no data; SW- no data

Indices — Rz: 40; 10cm flux: 87; Flare: 2/23.6; Ca: 11.0; Ip: 0; Ia: 4

Solar Regions

Sunspots

Aug. 14, 1977 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES

Bursts: cm, dm, m, Dkm

SID

X-Rays

Ap 12 — Kp: 1+ 1- 2+ 2+ 4+ 3- 3o 2+ — sc

Aurora: USSR, W.E.

Cosmic Rays

Green Corona — E. Limb 7 days earlier: NE-; SE; W. Limb 7 days later: NW- no data; SW- no data

Indices — Rz: 40; 10cm flux: 85; Flare: 9/22.4; Ca: 13.6; Ip: 0; Ia: 2

Solar Regions — (14906) N23

Sunspots

Aug. 15, 1977 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES

Bursts: cm, dm, m, Dkm

SID

X-Rays

Ap 11 — Kp: 2+ 4- 3+ 3o 2o 1o 2- 1+ — sc

Aurora: USSR, W.E.

Cosmic Rays

Green Corona — E. Limb 7 days earlier: NE-; SE-; W. Limb 7 days later: NW-; SW-

Indices — Rz: 42; 10cm flux: 85; Flare: 6/21.1; Ca: 14.8; Ip: 0; Ia: 2

Solar Regions — 14894 N21 (2); 19827 N20 (Bf)3 CMP Aug. 16

Sunspots

Aug. 16, 1977 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES

Bursts: cm, dm, m, Dkm

SID

X-Rays

Ap 9 — Kp: 1o 2- 1o 2- 4o 2- 2+ 2o — sc

Aurora: USSR, W.E.

Cosmic Rays

Green Corona — E. Limb 7 days earlier: NE-; SE; W. Limb 7 days later: NW-moderately bright; SW-

Indices — Rz: 38; 10cm flux: 85; Flare: 3/23.1; Ca: 12.5; Ip: 0; Ia: 2

Solar Regions — 14897 S26

Sunspots

Aug. 17, 1977 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES

Bursts: cm, dm, m, Dkm

SID

X-Rays

Ap29 D2 — Kp: 2o 3o 4o 6- 5o 4+ 3o 3+ — sc

Aurora — USSR, W.E.

Cosmic Rays

Green Corona — E. Limb 7 days earlier: NE- no data; SE- no data; W. Limb 7 days later: NW- moderately bright; SW- moderately bright

Indices — Rz: 36; 10cm flux: 85; Flare: 23/23.1; Ca: 16.9; Ip: 0; Ia: 2

Solar Regions — 14900 N36

Sunspots — (19829) N36 (αf)4

Aug. 18, 1977 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES

Bursts: cm, dm, m, Dkm

SID

X-Rays

Ap 13 — Kp: 4- 3- 3o 2+ 3- 3- 3- 2+ — sc

Aurora — USSR, W.E.

Cosmic Rays

Green Corona — E. Limb 7 days earlier: NE- no data; SE no data; W. Limb 7 days later: NW-; SW- moderately bright

Indices — Rz: 40; 10cm flux: 86; Flare: 0/24.0; Ca: 18.2; Ip: 0; Ia: 2

Solar Regions — 14899 N29; 14902 S23 (4)

Sunspots — (19828) N31 (αp)4; (19835) S22 (β)4; 19830 N27 (αp)4 CMP Aug. 17

Aug. 19, 1977 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES

Bursts: cm — 1n/99; dm, m, Dkm

SID

X-Rays

Ap24 D5 — Kp: 5o 5- 2+ 3+ 2o 3o 3+ 5- — sc

Aurora — USSR, W.E.

Cosmic Rays

Green Corona — E. Limb 7 days earlier: NE- no data; SE- no data; W. Limb 7 days later: NW- no data; SW- no data

Indices — Rz: 35; 10cm flux: 85; Flare: 23/24.0; Ca: 17.6; Ip: 0; Ia: 5

Solar Regions — 14903 N22 (2); 14907 S28 (4)

Sunspots — (19831) N19 (αp)4; 19833 N20 (β)3 CMP Aug. 18

Aug. 20, 1977 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES

Bursts: cm, dm, m, Dkm

SID

X-Rays

Ap 8 — Kp: 3+ 2o 3- 2o 2o 2- 1+ 1+ — sc

Aurora — USSR, W.E.

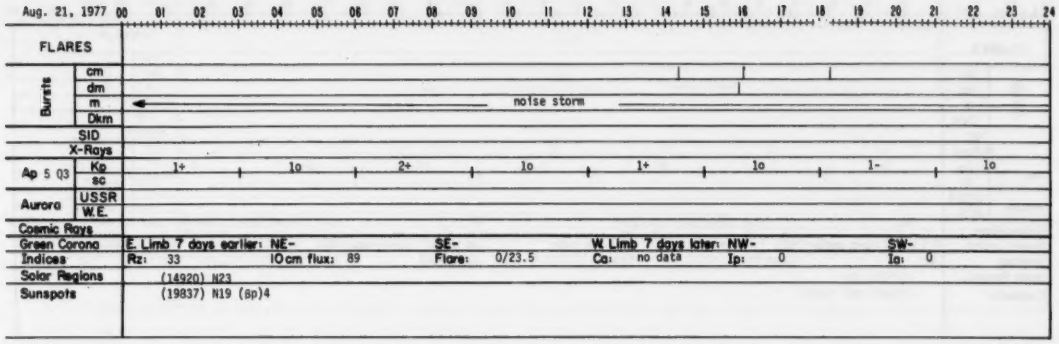
Cosmic Rays

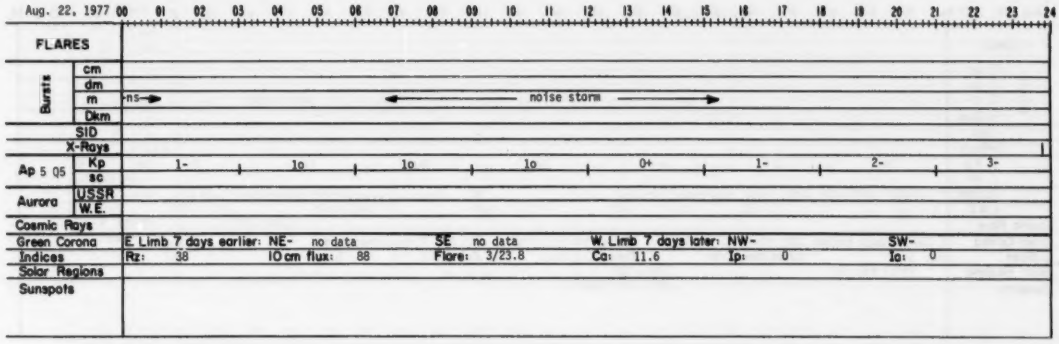
Green Corona — E. Limb 7 days earlier: NE- moderately bright; SE; W. Limb 7 days later: NW- no data; SW- no data

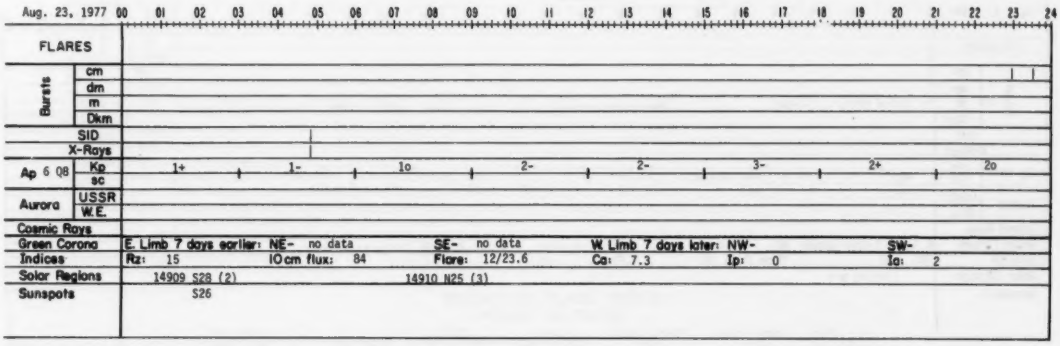
Indices — Rz: 33; 10cm flux: 87; Flare: 10/23.8; Ca: 14.7; Ip: 0; Ia: 1

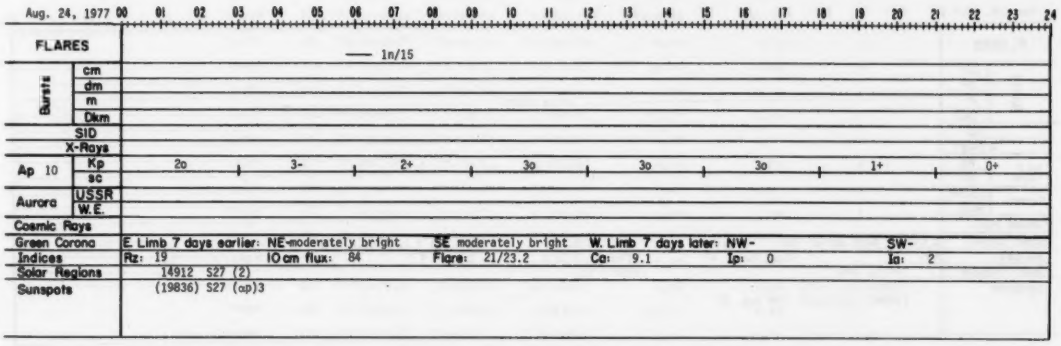
Solar Regions — 14904 N36; (14919) N10; 14908 N23

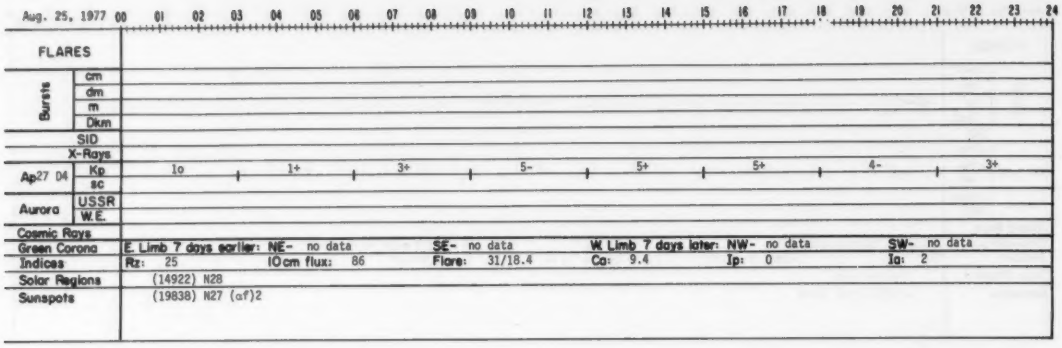
Sunspots — (19832) N22 (β)4

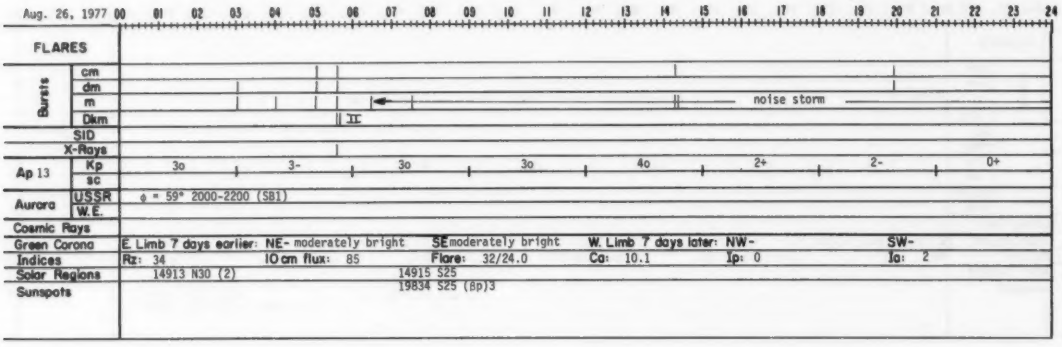

Aug. 21, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
Dkm
noise storm
SID
X-Rays
Ap 5 Q3
Kp
sc
1+ 1o 2+ 1o 1+ 1o 1- 1o
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- SE- W. Limb 7 days later: NW- SW-
Indices
Rz: 33 10cm flux: 89 Flare: 0/23.5 Ca: no data Ip: 0 Ia: 0
Solar Regions
(14920) N23
Sunspots
(19837) N19 (Bp)4

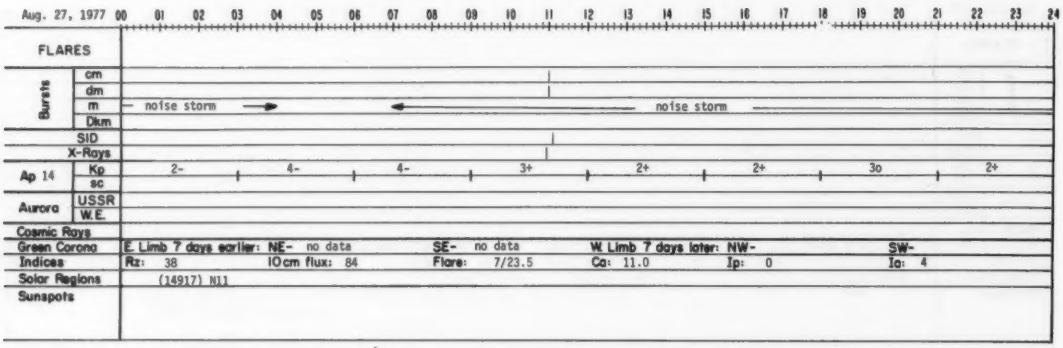

Aug. 22, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
Dkm
ns
noise storm
SID
X-Rays
Ap 5 Q5
Kp
sc
1- 1o 1o 1o 0+ 1- 2- 3-
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- no data SE no data W. Limb 7 days later: NW- SW-
Indices
Rz: 38 10cm flux: 88 Flare: 3/23.8 Ca: 11.6 Ip: 0 Ia: 0
Solar Regions
Sunspots

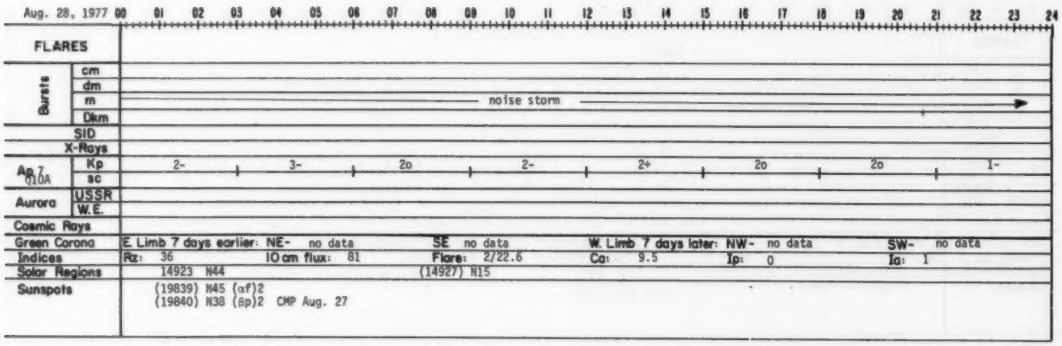

Aug. 23, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
Dkm
SID
X-Rays
Ap 6 Q8
Kp
sc
1+ 1- 1o 2- 2- 3- 2+ 2o
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- no data SE- no data W. Limb 7 days later: NW- SW-
Indices
Rz: 15 10cm flux: 84 Flare: 12/23.6 Ca: 7.3 Ip: 0 Ia: 2
Solar Regions
14909 S28 (2) 14910 N25 (3)
Sunspots
S26

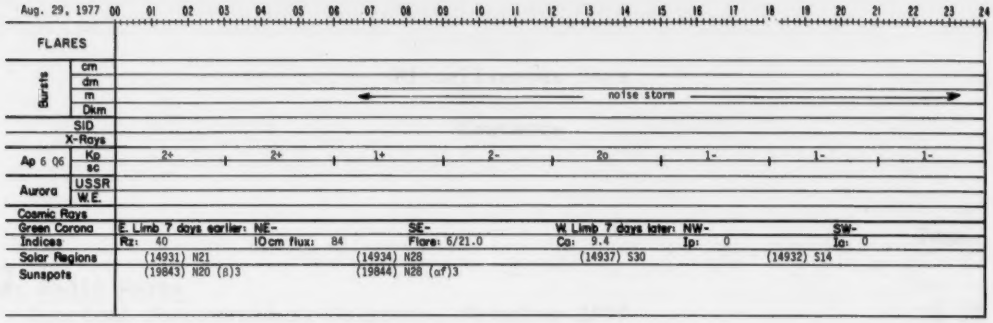

Aug. 24, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
1n/15
Bursts
cm
dm
m
Dkm
SID
X-Rays
Ap 10
Kp
sc
2o 3- 2+ 3o 3o 3o 1+ 0+
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE-moderately bright SE moderately bright W. Limb 7 days later: NW- SW-
Indices
Rz: 19 10cm flux: 84 Flare: 21/23.2 Ca: 9.1 Ip: 0 Ia: 2
Solar Regions
14912 S27 (2)
Sunspots
(19836) S27 (αp)3

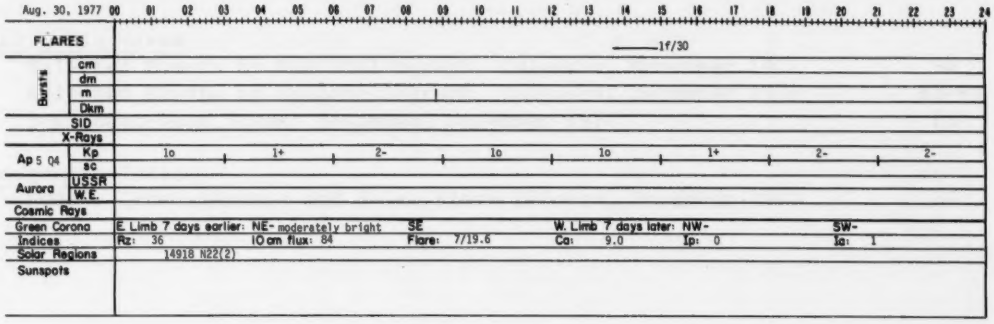

Aug. 25, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
Dkm
SID
X-Rays
Ap27 D4
Kp
1o 1+ 3+ 5- 5+ 5+ 4- 3+
sc
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- no data SE- no data W. Limb 7 days later: NW- no data SW- no data
Indices
Rz: 25 10cm flux: 86 Flare: 31/18.4 Ca: 9.4 Ip: 0 Ia: 2
Solar Regions
(14922) N28
Sunspots
(19838) N27 (αf)2

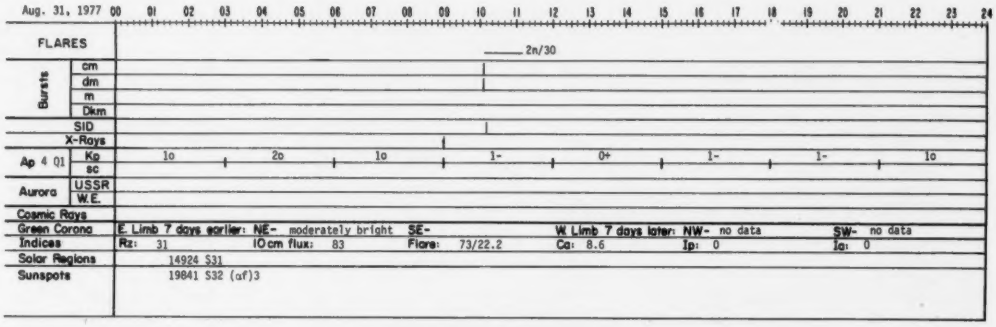

Aug. 26, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
noise storm
Dkm
SID
X-Rays
Ap 13
Kp
3o 3- 3o 3o 4o 2+ 2- 0+
sc
Aurora
USSR
φ = 59° 2000-2200 (SBI)
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- moderately bright SEmoderately bright W. Limb 7 days later: NW- SW-
Indices
Rz: 34 10cm flux: 85 Flare: 32/24.0 Ca: 10.1 Ip: 0 Ia: 2
Solar Regions
14913 N30 (2) 14915 S25
Sunspots
19834 S25 (Bp)3


Aug. 27, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
noise storm
noise storm
Dkm
SID
X-Rays
Ap 14
Kp
2- 4- 4- 3+ 2+ 2+ 3o 2+
sc
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- no data SE- no data W. Limb 7 days later: NW- SW-
Indices
Rz: 38 10cm flux: 84 Flare: 7/23.5 Ca: 11.0 Ip: 0 Ia: 4
Solar Regions
(14917) N11
Sunspots


Aug. 28, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
noise storm
Dkm
SID
X-Rays
Ap 7
Kp
2- 3- 2o 2- 2+ 2o 2o 1-
sc
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- no data SE no data W. Limb 7 days later: NW- no data SW- no data
Indices
Rz: 36 10cm flux: 81 Flare: 2/22.6 Ca: 9.5 Ip: 0 Ia: 1
Solar Regions
14923 N44 (14927) N15
Sunspots
(19839) N45 (αf)2
(19840) N38 (βp)2 CMP Aug. 27







REGIONAL FLARE INDEX

INCLUDES ALL FLARES

NO. MAIN PLAGE NO.	LAT	CMP DATE	DATE FIRST FLARE	DATE LAST FLARE	FLARE-INDEX SUM	FLARE-INDEX MEAN	TOTAL NO. OF FLARES
14888	N22	77/08/04.1	77/08/02	77/08/05	16.16	4.04	4
14888	N24	77/08/09.5	77/08/03	77/08/13	135.99	12.36	44
14893	S21	77/08/12.9	77/08/08	77/08/09	6.67	3.33	4
14894	N21	77/08/15.8	77/08/14	77/08/22	26.89	2.99	15
14897	S26	77/08/16.7	77/08/11	77/08/11	0.00	0.00	1
14899	N38	77/08/18.3	77/08/11	77/08/22	47.97	4.00	12
14902	S22	77/08/18.6	77/08/23	77/08/24	5.08	2.54	3
14903	N22	77/08/19.5	77/08/14	77/08/24	1.38	.13	2
14904	N36	77/08/20.2	77/08/14	77/08/14	2.69	2.69	3
14908	N23	77/08/20.8	77/08/23	77/08/25	5.89	1.96	3
14920	N22	77/08/21.9	77/08/24	77/08/25	12.51	6.26	5
14912	S26	77/08/24.6	77/08/23	77/08/23	3.38	3.38	1
14922	N28	77/08/25.2	77/08/27	77/08/27	3.39	3.39	1
14915	S25	77/08/26.8	77/08/23	77/09/01	88.34	8.03	27
14931	N21	77/08/29.8	77/09/01	77/09/01	2.84	2.84	1
14924	S30	77/08/31.3	77/08/26	77/09/03	3.59	.48	3

Miscellaneous Data

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SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS
NOVEMBER 1977

NOV 1977	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
01	0000	0715	CULG				0002	0003					IIIG,W
			CULG	0022.5	0023.5	1	0022.5	0023.5	1				IIIG
			CULG				0031.5		1				IIIB
			CULG	0125	0152								IS,W
			CULG	0649	0649.5	1	0647	0650	1				IIIG
	2015	2040	CULG	2015	2040								IS,W
			CULG				2023.5						IIIB,W
			CULG				2032.5		1				IIIB
	2104	2400	CULG	2104	2400								IS,W
			CULG				2107						IIIB,W
			CULG				2112		1				IIIB
			CULG				2349	2349.5					IIIG,W
02	0000	0715	CULG	0000	0715								IS,W
			CULG				0020	0020.5	1				IIIG
			CULG				0032	0033	1				IIIG
			CULG	0033.5		1							IIIB
			CULG				0650	0715					IS,W
	2015	2400	CULG	2015	2120	1							IS
03	0000	0715	CULG	0355	0715		0535	0715					IS,W
			CULG				0647.5	0648					IIIG,W
	2015	2400	CULG				2015	2016					IIIG,W
			CULG				2217.5	2218					IIIG,W
			CULG				2226						IIIB,W
			CULG				2237						IIIB,W
			CULG				2247						IIIB,W
04	0000	0716	CULG	0046	0048.5								IIIG,W
			CULG				0136	0136.5	2				IIIG
			CULG				0334.5	0335.5					IIIG,W
			CULG	0350.5			0350.5						IIIB,W
			CULG				0357	0358.5	1				IIIG
			CULG	0413	0414								IIIG,W
			CULG	0417	0418.5	1	0417	0418.5	2				IIIG
			CULG				0428		1				IIIB
			CULG				0503.5						IIIB,W
			CULG	0613	0716		0618	0716					IS,W
	2016	2400	CULG				2025	2026					IIIG,W
	2016	2400	CULG	2328.5	2329	1							FAST DRIFT
			CULG				2337.5		1				IIIB,U
			CULG				2347	2359	2				II
			CULG	2348.5	2349.5	1	2348.5	2349.5	1				IIIG
06	0000	0340	CULG										
	2015	2400	CULG										
07	0000	0715	CULG	0125	0125.5	1							IIIG
			CULG	0539	0540								UNCLF,W
			CULG				0544	0607	2	0603	0607	1	II, HB
			CULG				0545	0555	1				P
			CULG	0545	0715	1	0545	0715	1				IV
			CULG	0550	0612	1	0540	0715	1				IS
	2015	2400	CULG										
08	0000	0715	CULG	0257	0258	1							IIIG
			CULG				0337.5						IIIB,W
			CULG				0440.5	0441					IIIG,W
			CULG	0449	0449.5		0449	0449.5					IIIG,W
	2015	2400	CULG	2038	2039	1	2038	2039	1				IIIG
			CULG	2040.5	2041.5	1	2040.5	2041	1				IIIG
09	0000	0716	CULG	0304	0306.5	1							FAST DRIFT
			CULG	0437.5	0438	1							FAST DRIFT
	2016	2400	CULG				2024	2024.5	1				IIIG,U
10	0000	0420	CULG										
	0500	0716	CULG										
	2016	2400	CULG	2016	2030		2016	2255					IS,W
			CULG				2101.5	2102					IIIG,W

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

NOVEMBER 1977

NOV 1977	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
11	0000	0716	CULG				0700	0716	2				II
	2016	2400	CULG				2050	2051	1				IIIG
12	0000	0716	CULG	0114.5									IIIB,W
			CULG	0659	0659.5	1	0659	0659.5	1				IIIG
	2016	2400	CULG	2131.5	2134	1	2132.5	2134	1				IIIGG
			CULG	2135	2136	1							IIIG
			CULG	2221.5	2222	1							FAST DRIFT
			CULG	2225.5	2226	1							FAST DRIFT
			CULG	2307	2308	1							FAST DRIFT
13	0000	0716	CULG				0201	0205	1				IIIGG
	2016	2400	CULG	2350	2351.5	1							FAST DRIFT
14	0000	0716	CULG	0417	0420	1							FAST DRIFT
			CULG	2016	2400								IS,W
	2016	2400	CULG	2016	2017	1	2016	2017	1				IIIG
			CULG				2256		1				IIIB
			CULG				2258.5	2259	1				IIIG
			CULG	2318.5	2322	1	2318.5	2322	2				IIIGG,U
15	0000	0716	CULG	0000	0716								IS,W
			CULG	0231	0232		0231	0232					IIIG,W
			CULG	0232.5	0233	1	0232.5	0233	1				IIIG
			CULG				0238	0239					IIIG,W
			CULG				0239.5	0240	2				IIIG,U
			CULG	0252	0253		0252	0253					IIIG,W
			CULG	0447.5	0448.5	1	0447.5	0448.5	2				IIIG,U
			CULG	0545.5	0546	1	0545.5	0546	1				IIIG,U
			CULG				0550	0716					IS,W
			CULG	0551.5	0552		0551.5	0552					IIIG,W
	2016	2400	CULG				2016	2115	1				IS
			CULG	2016	2024.5	1	2022	2024	1				IIIGG
			CULG	2028.5		1	2028.5		1				IIIB
			CULG	2029	2029.5								IIIG,W
			CULG				2115	2330					IS,W
			CULG	2224.5	2225.5	1							FAST DRIFT
			CULG	2226.5			2226.5						IIIB,W
			CULG				2323.5	2324	2				IIIG,U
16	0000	0717	CULG				0208	0209.5					IIIG,W
			CULG	0232.5	0233.5								IIIG,W
			CULG	0240.5	0241	1	0240.5	0241	2				IIIG,U
			CULG				0248.5						IIIB,W
			CULG	0317.5	0318								IIIG,W
			CULG				0343.5		1				IIIB
			CULG				0407	0407.5	2				IIIG,U
			CULG	0409.5	0410.5		0409.5	0410.5					IIIG,W
			CULG				0450.5	0451	1				IIIG
			CULG	0502	0502.5		0502	0502.5					IIIG,W
			CULG				0513						IIIB,W
			CULG	0545	0717								IS,W
			CULG				0552.5	0553	1				IIIG
			CULG				0658		1				IIIB
			CULG	0705	0705.5	1							IIIG
			CULG				0706	0710.5	2				IIIGG,U
			CULG				0714.5						IIIB,W
	2017	2400	CULG				2054.5						IIIB,W
			CULG				2200	2300					IS,W
17	0000	0717	CULG	0107.5	0108	1	0107.5	0109	2	0108	0109	1	IIIG,V,U
			CULG				0144	0218					IIIN,W
			CULG	0525	0717		0405	0717					IS,W
			CULG	0548	0548.5	1	0548	0549	2	0548.5	0549	1	IIIG
			CULG				2017	2330	1				IIIS
	2017	2400	CULG	2017	2400	1	2017	2115	2				IS
			CULG				2115	2400	1				IS,C
			CULG				2330	2357					IIIN,W
18	0000	0711	CULG	0000	0711		0000	0711					IS,W

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS
NOVEMBER 1977

NOV 1977	TIMES OF OBSERVATION START UT	TIMES OF OBSERVATION END UT	STATION	EVENTS DECIMETRIC BAND START UT	DECIMETRIC BAND END UT	DECIMETRIC BAND INT	METRIC BAND START UT	METRIC BAND END UT	METRIC BAND INT	DEKAMETRIC BAND START UT	DEKAMETRIC BAND END UT	DEKAMETRIC BAND INT	SPECTRAL TYPE
18			CULG				0016.5	0017					IIIG,W
			CULG				0607	0711					IIIN,W
			CULG	2018.5		1	2018.5		1				IIIB
			CULG	2018	2400		2018	2400					IS,W
	2018	2400	CULG				2018	2400					IIIN,W
19	0000	0717	CULG	0000	0620		0000	0530					IS,W
			CULG				0038	0039	1				IIIG
			CULG				0101	0102	1				IIIG
			CULG				0515	0520	1				IIIG
	2017	2400	CULG										
20	0000		CULG	0000.5	0001.5	1	0000.5	0001.5	2				IIIG
	0230	0718	CULG				0259	0302	1				II
			CULG	0617	0620	1	0617	0619	2	0617.5	0618	1	IIIG,V,U
	2018	2400	CULG	2326	2327	1	2326	2327	1				IIIG
			CULG	2330	2400								IS,W
21	0000	0717	CULG	0000	0150								IS,W
			CULG				0105	0205	1				IS,C
			CULG				0152	0205					IIIN,W
			CULG				0205	0455					IS,W
	2018	2400	CULG										
22	0000	0718	CULG				0025						IIIB,W
	2019	2400	CULG				2220.5	2221	1				IIIG,U
23	0000	0711	CULG										
	2019	2400	CULG										
24	0000	0719	CULG				0113		1				IIIB
	2019	2400	CULG										
25	0000	0719	CULG										
	2019	2400	CULG										
26	0000	0719	CULG				0649.5	0652.5	1				UNCLF
			CULG				0710	0712.5	1				UNCLF
	2019	2400	CULG										
27	0000	0719	CULG				0152		1				IIIB
			CULG				0302.5						IIIB,W
			CULG				0358	0359	1				IIIG
			CULG				0616	0619					II, W
	2019	2400	CULG										
28	0000	0719	CULG				0137	0139	2				IIIG,U
	2020	2400	CULG				2147.5	2149					IIIG,W
			CULG				2225.5	2226					IIIG,W
			CULG				2240.5						IIIB,W
			CULG				2256	2257	1				IIIG
29	0000	0719	CULG				0209	0211					IIIG,W
			CULG				0548						IIIB,W
			CULG				0628	0629					IIIG,W
			CULG				0643.5						IIIB,W
	2019	2400	CULG										
30	0000	0720	CULG										
	2020	2400	CULG				2105.5		1				IIIB
			CULG				2111	2400					IIIN,W
			CULG				2118.5	2119.5	1				IIIG
			CULG				2144	2145.5	2				IIIG,U
			CULG				2159	2200	1				IIIG,U
			CULG				2202	2203	2				IIIG
			CULG				2206.5	2207	1				IIIG
			CULG				2236.5	2237	1				IIIG,U
			CULG	2257	2258	1	2256.5	2258	1				IIIG,U
			CULG	2308.5	2316	2	2308.5	2316	2	2310.5	2312	2	IIIGG
			CULG				2310	2312	3	2310	2312	2	IIIG,V
			CULG				2351.5	2359	2	2353.5	2354	1	IIIGG

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

DECEMBER 1977

DEC 1977	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
01	0000	0720	CULG				0000	0720	1				IIIN
			CULG	0003.5	0007	1	0003.5	0007	2				IIIGG,V
			CULG	0007.5	0008	1	0007.5	0008	2				IIIG
			CULG				0150	0151	2				IIIG
			CULG				0220	0221	2				IIIG
			CULG	0225.5	0231	2	0224.5	0231	2	0227	0230.5	2	IIIG
			CULG				0304	0305	2				IIIG
			CULG				0327.5	0328.5	2				IIIG,U
			CULG				0350	0354	2	0352.5	0353.5	1	IIIGG,V,U
			CULG				0359	0359.5	2				IIIG
			CULG				0403.5	0404	2				IIIG
			CULG	0406.5	0407	1	0406.5	0408	2	0406.5	0407	1	IIIG
			CULG				0422	0423.5	2				IIIG,U
			CULG	0424	0424.5	1	0423.5	0425.5	3				IIIGG
			CULG	0442.5	0443	1	0442.5	0443	2				IIIG
			CULG				0514	0515	2				IIIG
			CULG				0618	0632	2				IIIG,V,N
			CULG				2019.5	2023.5	2				IIIG
	2020	2400	CULG				2020	2400	1				IIIN
			CULG	2114	2121	1	2114	2119	2	2113	2114	1	IIIGG
			CULG				2216	2217	2				IIIG
			CULG	2232	2237	2	2231	2237	2	2232.5	2237	2	IIIGG
02	0000	0721	CULG				0000	0600	1				IIIN
			CULG	0058	0058.5	1	0058	0058.5	1				IIIG
			CULG				0111		2				IIIB,U
			CULG	0118.5	0119.5	1	0118	0122	3	0118	0122	3	IIIGG,V
			CULG				0237.5	0239	2	0238	0239	2	IIIG
			CULG				0358.5		1				IIIB
			CULG				0410		1				IIIB
			CULG				0418		2	0418		2	IIIB
			CULG				0439.5	0440	2	0439.5	0440	1	IIIG
			CULG				0537	0539	2				IIIG,U
	2021	2400	CULG				2022						IIIB,W
			CULG				2104	2106.5					IIIG,W
			CULG				2136	2137	2				IIIG
03	0000	0722	CULG				0020.5	0021.5	2				IIIG
			CULG				0026.5	0638					IIIN,W
	2025	2400	CULG				2106	2107	1				IIIG
			CULG				2119	2121	1				IIIGG
04	0000	0722	CULG				0155	0156					IIIG,W
			CULG				0520	0521	1				IIIG
			CULG				0605	0606					IIIG,W
	2023	2400	CULG				2112.5	2114	2				IIIG
			CULG				2155	2156.5	1				IIIGG
			CULG				2247.5						IIIB,W
			CULG				2250.5	2252					IIIG,W
			CULG				2306	2307	1				IIIG
			CULG				2318						IIIB,W
			CULG				2351.5		1				IIIB
05	0000	0722	CULG				0034	0722					IIIN,W
			CULG	0257.5	0258.5	1							IIIG
			CULG	0502.5	0503	1	0502.5	0503	1				IIIG,RS
			CULG	0505	0506	1	0505	0506	1				IIIG,RS
	2022	2400	CULG				2022	2400	1				IIIN
			CULG	2148	2400								IS,W
			CULG	2307.5	2308	2	2307	2308	2	2308	2308.5	1	IIIGG,U
			CULG	2309	2315.5		2309	2316					IIIGG,U
06	0000	0723	CULG	0000	0723	1	0000	0723	1				IIIN
			CULG	0000	0723		0034	0723					IS,W
			CULG				0103	0104	1				IIIG,U
			CULG	0143	0146	1							IIIGG,RS
			CULG				0143	0146	1				IIIGG,U
			CULG				0159	0200	2				IIIG,U
			CULG				0207	0207.5	2				IIIG
			CULG	0257.5	0258.5	1	0257.5	0258.5	2				IIIG

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

DECEMBER 1977

DEC 1977	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
06			CULG	0337	0339	1	0337	0339.5	2				IIIGG,U
			CULG	0343		1	0343		1				IIIB,U
			CULG	0349	0350	1	0349	0350.5	2	0349	0350	1	IIIGG
			CULG				2023	2220					IS,W
	2023	2400	CULG				2023	2400	1				IIIN
			CULG				2114	2115	2				IIIG
			CULG				2329	2330.5	1	2329	2330	1	IIIG
07	0000	0724	CULG				0000	0724	1				IIIN
			CULG	0056.5	0100	2	0059	0059.5	1				IIIGG
			CULG				0127	0127.5	1	0127	0127.5	1	IIIG
			CULG				0333	0339	2	0333.5	0338	2	IIIGG
			CULG	0420.5	0421								IIIG,W
			CULG	0550	0550.5	1	0550	0555	2				IIIGG
			CULG				0636	0637	2				IIIGG
			CULG	0642.5	0644	1	0642.5	0644	2	0642.5	0644	2	IIIGG
	2024	2400	CULG	2024	2400	1	2024	2400	2				IIIN
			CULG	2117.5	2118	1	2117.5	2119	3	2117.5	2118	2	IIIG,V
			CULG				2145	2146	2	2145.5	2146	2	IIIG
			CULG				2236	2239	2	2237.5	2238	1	IIIGG,V
			CULG				2255.5	2257.5	2	2256	2257	1	IIIG
			CULG	2330	2400								IS,W
08			CULG	0000	0220		0120	0430					IS,W
	0000	0723	CULG	0000	0723	1	0000	0723	2				IIIG,N
			CULG	0022.5	0023	1	0022	0023.5	2	0022.5	0023.5	2	IIIGG,V
			CULG	0034	0036	1	0034	0036	2				IIIG,V,U
			CULG				0257	0305	2				II, HB
	2025	2400	CULG	2025	2400	1	2050	2400	1				IIIN
			CULG	2052.5	2053	1	2052	2054	2				IIIG
			CULG	2320	2330								IS,W
			CULG				2348.5	2351	2				IIIG
			CULG				2355.5	2356.5	2	2355.5	2356	2	IIIG
			CULG				2359.5	2401	2	2400	2400.5	2	IIIG
09	0000	0724	CULG	0000	0724	1	0000	0724	2				IIIN
			CULG				0034	0038.5	3	0034.5	0038.5	2	IIIGG
			CULG	0652	0653	1	0650	0654.5	2	0652	0653	1	IIIGG
			CULG	0712.5	0715	2	0712.5	0715	2				IIIGG
	2025	2400	CULG	2025	2400		2025	2400					IS,W
			CULG				2025	2400	1				IIIN
			CULG				2333.5	2334.5	2	2333.5	2334	1	IIIG
10			CULG	0000	0725		0000	0725					IS,W
	0000	0725	CULG				0000	0725	1				IIIN
			CULG				0114	0115.5	1				IIIG,U
			CULG				0214.5	0215.5	2	0214.5	0215.5	1	IIIG
			CULG				0233.5	0237	2	0234	0236	2	IIIG,V
			CULG							0310	0335	1	SWF
			CULG				0313	0338	1				II
			CULG	0317	0725	2	0323	0725	2				IV
			CULG				0612	0617	2	0612	0615.5	1	IIIGG,V
			CULG				0618.5	0631	2				II, HB
			CULG	2025	2400		2025	2400					IS,W
	2025	2400	CULG				2025	2400	1				IIIS
			CULG				2057	2100	2				IIIGG
			CULG				2111.5	2112.5	1				IIIG
			CULG	2152.5	2153	1	2152.5	2153	2				IIIG
11	0000	0725	CULG	0000	0515		0000	0515					IS,W
			CULG				0000	0725					IIIS,W
			CULG	0515	0725	1	0515	0725	1				IS,DC
			CULG	2025	2400		2025	2400					IS,W
	2025	2400	CULG				2025	2400	1				IIIS
			CULG				2201.5	2206.5	1				IIIGG
12	0000	0725	CULG				0000	0725					IIIS,W
			CULG	0000	0725	1	0000	0725	1				IS
			CULG	0037.5	0038.5	2	0037.5	0038.5	2				IIIG,U
			CULG	0039	0040.5	2	0039	0040.5	2				IIIG,U

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

DECEMBER 1977

DEC 1977	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
12			CULG	0235	0725	1							IIIN
			CULG				0649	0651	3	0649	0650.5	2	IIIG
	2026	2400	CULG				2026	2400					IIIS,W
			CULG	2026	2400		2026	2400					IS,W
13	0000	0712	CULG				0000	0115	1				IS
			CULG	0000	0220								IS,W
			CULG				0000	0712					IIIN,W
			CULG				0115	0712					IS,W
			CULG	0220	0305	1							IS
			CULG	0305	0712								IS,W
			CULG	0420	0421.5								IIIG,W
			CULG				2026	2400	1				IS,DC
	2026	2400	CULG				2026	2400	1				IIIS
			CULG	2026	2400								IS,W
14	0000	0726	CULG				0000	0430					IIIS,W
			CULG	0000	0726		0000	0726					IS,W
			CULG	0124	0320	1							IIIN
			CULG				0148.5		1				IIIB,U
	2026	2400	CULG				2210						IIIB,W
15	0000	0727	CULG				0323						IIIB,W
	2028	2400	CULG										
16	0000	0727	CULG				0338	0341	1				IIIG
			CULG				0711						IIIB,W
	2028	2400	CULG				2205	2207	1				IIIG
			CULG				2323	2325	1				IIIG
17	0000	0728	CULG				0338.5						IIIB,U,W
	2029	2400	CULG										
18	0000	0713	CULG				0205.5						IIIB,W
	2029	2400	CULG				2029	2230					IS,W
			CULG				2102						IIIB,W
			CULG				2111						IIIB,W
			CULG	2330	2350								IS,W
			CULG				2343	2344					IIIG,W
19	0000	0729	CULG				0204	0647					IIIN,W
	2030	2400	CULG				2030	2400					IS,W
			CULG				2034	2035	1				IIIG
			CULG				2044	2045					IIIG,W
20	0000	0730	CULG				0000	0050					IS,W
	2030	2400	CULG				2030	2335					IS,W
			CULG	2244.5	2245		2244.5	2245					IIIG,W
			CULG				2347.5	2348.5					IIIG,W
			CULG				2350	2350.5					IIIG,W
21	0000	0730	CULG				0116.5						IIIB,W
			CULG				0143.5		1				IIIB
			CULG				0222.5	0223.5	2				IIIG
			CULG				0224	0225					IIIG,W
			CULG				0233.5						IIIB,W
			CULG				0321	0321.5					IIIG,W
			CULG	0419.5		1	0419.5		1				IIIB
			CULG				0705						IIIB,W
	2030	2400	CULG	2030	2400		2030	2400					IIIN,W
			CULG	2151	2152	1	2151	2152	1				IIIG
22	0000	0730	CULG	0000	0630		0000	0630					IS,W
			CULG				0000	0730					IIIN,W
			CULG	0630	0730	1	0630	0730	1				IS
			CULG				2030	2400	1				IIIN
	2030	2400	CULG	2030	2400		2030	2400					IS,W
			CULG				2051.5	2057	1				IIIGG
			CULG	2102.5	2103.5	1	2102.5	2104	1				IIIGG
			CULG				2204	2204.5	1				IIIG

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

DECEMBER 1977

DEC 1977	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
23	0000	0730	CULG	0000	0730		0000	0730					IS,W
			CULG				0000	0730	1				IIIN
			CULG				0104		2				IIIB
			CULG	0228	0228.5	1	0228	0229.5	2	0228.5	0229.5	2	IIIGG
			CULG	0633.5	0642	2	0633.5	0642	2	0635.5	0637	2	IIIGG
			CULG				0655	0656	2				IIIG
	2046	2400	CULG	2046	2400		2046	2400					IS,W
			CULG	2046	2142	1	2046	2400	1				IIIN
24	0000	0731	CULG	0000	0731		0000	0731					IS,W
			CULG				0000	0731	1				IIIN
			CULG	0007.5	0010.5	1	0007.5	0022	1				IIIGG
			CULG	0322.5	0323	1	0322.5	0323	2				IIIG
			CULG	0326.5	0327	2	0326.5	0327.5	2				IIIG,U
			CULG	0653.5	0654.5	1	0653.5	0654.5	1				IIIG
	2031	2400	CULG				2031	2400	1				IS
			CULG	2031	2400								IS,W
			CULG				2031	2400					IIIS,W
			CULG				2224	2225	1				IIIG
25	0000	0732	CULG				0000	0045	1				IS,DC
			CULG	0000	0732								IS,W
			CULG				0000	0030					IIIN,W
			CULG				0030	0732					IIIN,W
			CULG				0045	0510					IS,W
			CULG				0349	0350	1				IIIG
			CULG				0408	0417	1	0416	0417	1	IIIGG
			CULG				0440	0445	2	0442	0443	2	IIIG
			CULG	0557.5	0605	1	0557	0604	2	0559.5	0603	1	IIIGG,U
			CULG	2039	2220								IS,W
	2039	2220	CULG				2039	2220	1				IIIN
	2300	2400	CULG				2300	2400					IIIN,W
26			CULG				0204	0205					II, W
			CULG	0250	0732								IS,W
			CULG				0253.5	0254.5					IIIG,W
	0000	0732	CULG	0312	0708		0000	0732					IIIN,W
			CULG	0429	0431	1	0429	0431	1	0429.5	0431	1	IIIG,U
			CULG				2035	2400	1				IIIN
	2035	2400	CULG				2035	2235					IS,W
			CULG	2058	2059	1	2058	2101.5	2	2058.5	2059	2	IIIGG
			CULG				2302	2305	2	2302.5	2305	2	IIIG,V
			CULG	2337	2342	1	2336	2339	2				IIIGG
27	0000	0733	CULG				0000	0733					IIIN,W
			CULG	0052	0105								IS,W
			CULG	0705	0706	1	0705	0706.5	2	0705	0706.5	1	IIIG,V
			CULG	0706.5	0708	1							IIIG
	2034	2400	CULG	2045	2400	1	2034	2400	2				IIIN
28	0000	0315	CULG				0000	0315	1				IIIN
			CULG	0103	0315								IS,W
			CULG				0300	0530	2				IIIG,N
	0430	0745	CULG										
			CULG	0445	0700								IS,W
			CULG	0447	0447.5	1	0446.5	0447.5	1				IIIGG
			CULG				0503	0745					IIIN
			CULG				0639.5	0640.5	2	0639.5	0640.5	2	IIIGG
			CULG	0639	0642.5	1	0639	0642.5	1				IIIGG
	2124	2400	CULG	2114	2230	1	2114	2400	1				IS
			CULG	2217.5	2220.5	1	2217.5	2221	2	2218	2221	2	IIIGG
			CULG				2320.5	2327.5	1	2320.5	2326	1	IIIGG
29	0000	0734	CULG				0000	0330					IS,W
			CULG				0006	0011	2	0006.5	0007.5	1	IIIGG
			CULG				0128	0633					IIIN,W
	2035	2400	CULG				2055	2204					IIIN,W
30	0000	0420	CULG				0024	0420					IIIN,W
			CULG	0408	0412	1							IIIGG,U

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

DECEMBER 1977

DEC 1977	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
30			CULG							0410	0420	1	SWF
			CULG				0412	0416	1				II
	0458	0735	CULG				0458	0525					IIIN,W
	2035	2400	CULG	2035	2400								IS,W
			CULG				2115	2340					IIIN,W
31	0000	0735	CULG	0000	0735								IS,W
			CULG	0109	0331		0016	0415					IIIN,W
	2035	2400	CULG				2035	2036	1				IIIG
			CULG	2148	2400								IS,W
			CULG	2153.5	2155	1	2153.5	2155	1				IIIG
			CULG				2238						IIIB,W
			CULG				2244						IIIB,W

SELECTED SOLAR EVENTS

NOVEMBER 1977

Culgoora

UT Date 197.. NOVEMBER	HELIOGRAPH EVENT							Spectral Type	REMARKS
	Start (UT)	End (UT)	Freq. (MHz)	Positions		Polarization	Intensity (1-3)		
				Central Dist. (R_o)	Position Angle (Deg.)				
5	2347	2356	80	1.2	115	-	3	II	Flare from behind the limb.
14	2319	2321	43.25) 80) 160)	1.2 1.1 1.1	55	-	3) 2) 1)	IIIGG,U	*
14/15	2300	0500	160	1.0	270	Unpol	1	I	
16	0239	0241	160	1.0	270	-	3	IIIG,U	*This region produced type III activity until 18
17	0107	0109	43.25) 80) 160)	1.2 1.2 1.1	270	-	3	IIIG,V,U	*
17/18	2300	0500	80) 160)	.9	50	£	1) 2)	I	This region persisted from 16th until 21st
27	0358	0359	80) 160)	.8	40	-	2) 1)	IIIG	
28	0137	0139	80) 160)	1.1	125	-	3) 2)	IIIG,U	

Days without Heliograph observations: 20th

* Other type III's observed from same position during the day.

SELECTED SOLAR EVENTS

DECEMBER 1977

Culgoora

UT Date 197.Z December	HELIOGRAPH EVENT							Spectral Type	REMARKS
	Start (UT)	End (UT)	Freq. (MHz)	Positions: Central Dist. ($R_\odot$)	Positions: Position Angle (Deg.)	Polarization	Intensity (1-3)		
1	0003	0005	43.25 80 160	1.0	130	-	3	IIIGG,V	*Type III activity persisted from this region until 3rd Dec.
6	0031	0104	80 160	.7	200	R	Not recorded	I	
	0143	0144	160	.1	250	-		IIIGG,U*	
	0349	0350	80 160	1.0	165	-		IIIGG	*
7	0333	0339	43.25 80 160	1.1	230	-	3	IIIGG	
7/8	2304	2305	43.25 80 160	.8	245	-	3 2 1	IIIG	*Type III activity persisted from this region until 10 Dec.
	0022	0024	43.25 80 160	1.1	110	-	3 3 2	IIIGG,V	*Type III activity persisted until 10 Dec.
	0034	0036	43.25 80 160	1.1 .9 .9	330	-	3	IIIG,V,U	*Type III activity persisted until 9 Dec.
	0257	0303	43.25 80 160	1.1	110	-	3 3 2	II	
8	2355	2357	43.25 80 160	.8	180	-	3 3 1	IIIG	*

Days without Heliograph observations: .....NIL.....

*Other type III's observed from same position during the day.

SELECTED SOLAR EVENTS

DECEMBER 1977

Culgoora

UT Date 197.Z DECEMBER	HELIOGRAPH EVENT							Spectral Type	REMARKS
	Start (UT)	End (UT)	Freq. (MHz)	Positions: Central Dist. ($R_\odot$)	Positions: Position Angle (Deg.)	Polarization	Intensity (1-3)		
9/10	2330	0414	160	.9	150	Varying	1	I	This complex type I region persisted until 14th
	0048	0049	43.25 80 160	1.1	105	- 	3 2 2	IIIG	*
	0114	0115	43.25 80 160	.2	140	- 	3 2 2	IIIG,U	*
	0233	0236	43.25 80 160	.9	115	- 	3 2 2	IIIG,V	*
	0310	0414	43.25 80 160	.2	140	See note	3	(II (IV	Complete source structure polarization of type IV developing into RH
11	0127	0132	80 160	1.1	255	R	2	I	Type I persisted from this region until 12th
17/18	2300	0500	160	1.1	70	Varying	2	I	Type I activity persisted until 25 Dec.
21	0222	0225	43.25 80 160	1.0	70	- 	3 3 2	IIIG	Type III activity from this region persisted intermittently until 24th
24	0326	0328	43.25 80 160	.8	0	-	3	IIIG,U	*

Days without Heliograph observations: NIL

*Other type III's observed from same position during the day.

SELECTED SOLAR EVENTS

DECEMBER 1977

Culgoora

UT Date 197..7 DECEMBER	HELIOGRAPH EVENT							Spectral Type	REMARKS
	Start (UT)	End (UT)	Freq. (MHz)	Positions: Central Dist. ($R_\odot$)	Positions: Position Angle (Deg.)	Polarization	Intensity (1-3)		
25	0440	0444	43) 80)	1.0	115	-))	3 2	IIIG	
	0310	0330	160	.9	260	r	1	I	This type I region persisted intermittently until 28 Dec., accompaniced by type III activity.
26	0200	0201	80) 160)	.6 .5	290	-	2	IIIG	
	0203	0257	80) 160)	1.1	105	r-R	2	II	
	2336	2342	43.25 80 160	1.2 1.1	295	-	3	IIIGG	*Type III activity from this region also on 28th
28	2327	2328	43.25) 80) 160)	1.2	50) 70) 85)	-	3 2 1	IIIG	
29	0005	0009	43.25) 80) 160)	1.0 .9 .8	320	-	3 3 2	IIIGG	
30	0029	0030	160	.5	320	-	2	IIIG	
	0411	0414	80) 160)	.5	320	-	3	II	
30/31	2300	0500	160	.5	330	R	1	I	

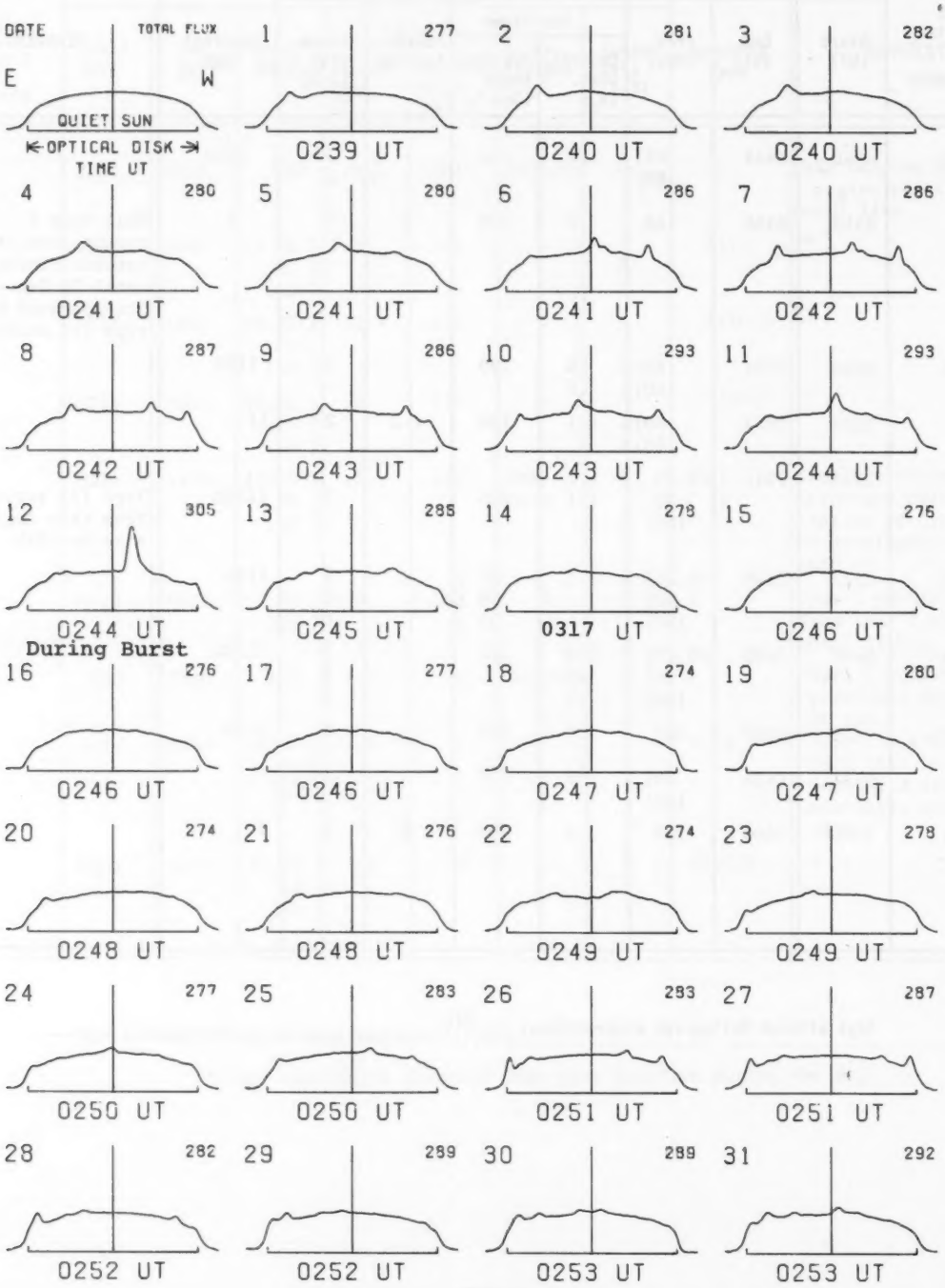
Days without Heliograph observations: NIL

EAST-WEST SOLAR SCANS

DECEMBER 1977

TOYOKAWA, JAPAN

3 CM
FAN BEAM WITH 1.1 MINUTES OF ARC



SUDDEN COMMENCEMENTS AND SOLAR FLARE EFFECTS

DECEMBER 1977

PRELIMINARY REPORT ON RAPID MAGNETIC VARIATIONS (by Dr. A. Romana).
The meaning of the station symbols is given in the IAGA-Bulletin nr. 32.
Times of ssc are mean values.

Sudden commencements followed by a magnetic storm or a period of storminess (ssc),

01 2029 A: SO LM; B: WN FU HB KS; C: TL

Solar-flare effects (sfe)
Effects confirmed by ionospheric or solar observations are underlined.

10 0307 - 0337 MT KA KY

26 2226 - 2352 KA

30 0409 - 0446 MT KA KY

Very unusual events

28 1942 bp CZ (---)

1955 bp KG (+280γ -130γ +130γ)

1955-2029 pi 1-2 WN (60s 25γ within bps)

1957-2025 pg FU (within b, large pi2)

1959 bps WI (+-)

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